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GAME ENGINE SPECIAL

ENGINES OF CHANGE

- How low can the Big Three go? Epic, Unity and Crytek on the move to free
- Gabe Newell on opening up Source 2
- Alt.engines: GameGuru, Construct 2 and ChilliSource
- Meet the studios that build their own

INSIDE ▸ QA • LIVE OPERATIONS • SOUND ENGINES • ENLIGHTEN 3 • MASSIVE ENTERTAINMENT

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ISSUE 159 APRIL 2015

ENGINES SPECIAL

THE GREAT GAME ENGINE GIVEAWAY
Following the major announcements at GDC, we speak to Epic Games, Unity, Crytek, Autodesk and Valve's Gabe Newell about the increased competition and race towards free tools

THE OTHER ENGINES
Alternative tools round-up

BUILD YOUR OWN
We speak to studios that do

GEARED FOR SOUND
A look at audio engines

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EDITORIAL

ENGINES: YOUR START

BECAUSE 'START YOUR engines' would be just a little too cliché. But my clumsy headline is still pertinent: game engines are one of the best places to start your development career.

Engines are the foundation of any title, the cement between your bricks of innovative ideas and groundbreaking new features. Most encompass every aspect of development, including audio, animation, modelling and so on. With the right engine, it's possible to learn the entire pipeline of producing a game, even if you're working solo.

And some, including Unreal Engine 4, even bundle in the full source code giving devs all they need to understand what's underneath the hood of the best games.

I've spoken before about the ongoing democratisation of game engines and how it ushers in a new era where games development is open to more people than ever – and Epic's surprise decision to make UE4 free is further proof of that.

Yes, the five per cent royalties the firm insists on can be too steep for some studios, but there are plenty of royalty-free options out there. In fact – as you'll discover within this very issue – there is a multitude of alternative engines on the market, all at different price points and requiring varying levels of skill. Heck, many studios even go as far as to create their own.

The point is with the plethora of accessible tech out there, not to mention the communities helping each other unlock each tool's secrets, there are no barriers to entry anymore. Anyone can bring their vision for a game to life.

The result can only be new game ideas, fresh takes on established mechanics and genres. And even with the wonders of the indie revolution, that's something the industry is still in sore need of.

James Batchelor
jbatchelor@nbmedia.com

Free for all

Announcements at last month's GDC by the big 3D engine makers continued a trend to lower price-entry and expanded services for the top tools. We asked those running the show what's behind this arms race

by Craig Chapple

COMPETITION IN THE game engine space is heating up.

GDC saw significant announcements from Unity and Epic. Unreal Engine 4 has gone free – plus a five per cent royalty fee on gross revenue – while Unity has revamped its Free and Pro packages.

Developers can now get access to the entire Unity 5 engine for free with the Personal addition, while the $75 per month Professional package, a price that has stayed consistant from Unity 4, now offers new Cloud services, analytics and performance reporting.

Valve is also set to make its own waves in the space with the completely free Source 2 engine, available to both developers and players interested in creating content for their favourite games. Meanwhile Autodesk teased plans for its new Stingray engine.

Despite the tech giant's roster of tools, it will be hard pushed to charge a significant fee for Stingray, given the low-priced nature of its fierce competitors in the space.

And let's not to forget the plethora of other excellent game engines available to developers (*see our engines feature on pg. 29*).

SET THEM FREE

Moves by the engine giants paint a picture of an industry that, affected by the indie revolution years back, have almost been forced to lower their prices to ensure they aren't missing out on the millions of devs out there looking for the right tools.

In Epic's case, though last year's turn to a subscription model saw the community grow by a factor of 25, money up-front still proved to be a hurdle for some.

"Just the effort of having to enter a credit card into a website is a barrier for people nowadays," said Epic CEO Tim Sweeney. "There is so much great stuff available that doesn't have any barrier to entry at all. We met a large number of people who just hadn't jumped in yet because of the paywall associated with it. In restrospect, I see exactly where they are coming from."

Left-to-right: Faruki Yerli, John Riccitiello and Tim Sweeney

Above clockwise: Weta Digital's Unreal Engine 4-powered VR demo Thief in the Shadows, Crytek's Back to Dinosaur Island demo, Epic's UE4 Kite Open World cinematic and Unity's Blacksmith video

Sweeney added that having so many tools available for free is liberating for developers, who can download them at a click of a button on their computer to test them out.

"It's a great business model. It's great for users and it's great for developers," he continued. "It means that anybody can try anything and then choose the best among all the options. It's a much superior model I think. Especially with commercial software, having to go and pay usually hundreds of dollars to buy a 3D package and then potentially realise you bought the wrong one."

Unity has long been available for free, but with Epic moving to a free base model and CryEngine adopting a low subscription fee last year, does this mean Unity has lost its unique selling point in the market? Not so, says a feisty John Riccitiello, the firm's new CEO.

"No one makes the complete package we do, not even close," he said. "What Unity allows, and the ease of use of Unity to build content on multiple platforms of the high quality we allow users or developers to do, is really unmatched out there.

"I also don't think that a royalty model is particularly

> ***"Free means anybody can try anything and choose the best option."***
>
> Tim Sweeney, Epic

// MEANWHILE ON DEVELOP-ONLINE.NET

How UltraHaptics lets players interact with objects made from thin air
deve1op.net/1xOuXeW

Hands-on with Valve and HTC's new virtual reality headset Vive
deve1op.net/187Zt7k

Tommy Palm discusses Swedish games development camp Stugan
deve1op.net/1DdUcb9

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democratic. If someone achieves significant success, it ends up being a ridiculous axe on success. And we're really not about being a cap on success."

HOW LOW CAN THEY GO?

A race to the bottom seems apparent then in the game engine space. The healthy competition between fierce rivals after the largest slice of the pie has driven down prices – as clearly have industry shifts toward independent development.

But if you speak to Sweeney or Riccitiello, there's no race occurring. Both are adamant they are setting out their own paths that will ultimately lead to better tools for developers.

"I certainly don't see it," said Sweeney of a race to the bottom. "I think what you'll see is developers able to try everything, choose the best technology for them, and ship games that are better, significantly better than what they would have been able to create with what was readily available just a few years ago.

"All along during this time there have been some open source engines you can go and download for free. Now everything is available for free. I don't think it's a race to the bottom; what we're seeing now is games development going mainstream."

Riccitiello said Unity's 'race' "involves a 12-year commitment to solving partner problems so developers don't have to", and one that it is spending tens of millions a year to achieve.

"If others are doing that [racing to the bottom] they will at some point be unable to make the investments they need to make to actually make a worthy product," he said.

IN DEFENCE OF PAID

One firm that isn't offering its engine for free, yet at least, is Crytek. It introduced a subscription fee for CryEngine last year, but that's as far it's willing to go, co-founder Faruk Yerli told *Develop*.

He explained that while the firm still maintained a segment for those triple-A developers after a different kind of licence, the subscription package was for indies looking for solid techn but perhaps do not need access to the source code. It's a deal Yerli feels is fair and is reluctant to alter the model.

"Royalties for us were an issue," he said. "Because we don't want to ask a small developer to share your profit with us. If you make one game successful and you want to make a bigger one next time, then let's talk about that game, we don't want to milk your first one, it's fully yours."

But where does that leave Crytek in the market now? Can CryEngine compete when so many other options are available to use freely, or at least try at no cost? Yerli explained how Crytek sees the industry, in terms of the type of developers there are.

"With CryEngine, Crytek is going to the high-end," he explained. "There is a low-end, mid-end and a high-end, when you classify good tech. Unity wants the low-end part.

He added: "Unreal is coming from, I would say, mid-end to high-end. But they also want to do the low-end. Which I would say is a bit tricky. But if you have a certain success you can do it, it's not impossible."

One brave new company entering the 3D game engine space is tech giant Autodesk, which already develops a swathe of tools under its Gameware label such as Scaleform, HumanIK, Beast, Navigation and other useful software including Maya and 3ds Max.

BREAKING IN

Called Stingray and built on the BitSquid engine acquired in June last year, the firm's product marketing expert Wesley Adams said the firm aims to build a tool that will "drastically improve the way 3D games are made". But Autodesk will be hard pressed to charge a high fee for it.

When asked for his opinion on the lowering of prices from the top engine makers – he was not yet prepared to disclose potential licensing options for Stingray – Adams said the moves weren't necessarily good or bad, but just reflected a need to change the way tools are purchased by developers.

"For example, at Autodesk, we created low cost monthly subscription plans for Maya LT," he said.

"That was new for the 3D industry at the time, but today is standard. And subscription models are how the vast majority of indies use Maya LT. Changes like this are great because it makes it easier for more creative people to get into game-making."

The industry's top engine providers are all confident that moving to lower-entry pricing models is the best option for both them and developers. For creators, it's one of the best eras ever to be making games, no doubt, but tools firms will need to make sure they remain competitive with the fierce and extremely competent rivals. There's no going back. ■

For more on our game engines special, see our round-up on pg. 29, why some developers are building their own engines on pg. 32, and a look at the top sound engines on pg. 34.

SOURCED OUT

Valve is set to be the latest player to make a big move in the market. It plans to make the Source 2 game engine available freely to developers and players interested in creating content for their favourite games.

> ***If Epic likes Valve's tool and wants to ship it with UE4, great.***
> Gabe Newell

Speaking to *Develop* at GDC, CEO Gabe Newell said the engine has two key design goals: to support VR and those content creating players, and make production as efficient as possible.

"There will be stuff in there, there will be tools," he said. "There will be a tool in there that's really useful for generating normals on

textures. And if Epic says, 'we like this tool', and they want to ship it with theirs [UE4], that's great. It's really just available to anybody.

"All we're doing essentially is we're moving our investment forward and we assume we're going to make our money on the back-end. And that's the great thing about the PC, it's going great and people are coming up with all these ideas, it's where the action is."

Dare 2015 'more open than ever'

Organisers revamp event as they aim to offer a launchpad for innovative and new student-made games

by James Batchelor

ABERTAY UNIVERSITY HAS overhauled the rules for its annual student contest Dare to be Digital, promising the 2015 iteration will be more open than ever.

Now in its 16th year, the entry requirements have been broadened to allow teams of up to eight people to compete. Students can be from anywhere around the world, but will need the endorsement from a teacher at their university.

Crucially, entrants no longer need to build a game from scratch over the course of the competition's eight weeks. Instead, Abertay is allowing students to use the time to finish previous projects – whether from their studies, or from game jams – providing the title has been in production for less than a year.

The university's Professor Louis Natanson stressed that this will not upset the balance of the competition.

"We're really focusing on the importance of creativity and innovation," he told *Develop*. "The key is how exciting and original the game idea is, rather than a bigger team with more development time having any natural advantage. We want to see the next *Papers, Please* or *Monument Valley* start life at Dare to be Digital."

Natanson added that the competition has been revamped in order to bring it in line with the ongoing changes to the world of games development.

"The games industry has seen dramatic changes in 16 years and we need to ensure that our competition reflects the skills needed by aspiring developers and the new opportunities that are open to them," he said. "When Abertay University first launched Dare, the focus was on linking students to employment opportunities with big companies – particularly producing triple-A titles.

> ***"It was time for us to embrace a wider and more diverse spectrum."***
>
> Louis Natanson, Abertay

"But halfway through the life of Dare, the iPhone launched, and the industry now also includes a significant segment of indie developers and smaller companies specialising in niches of mobile or PC gaming.

"It was time for us to open up much more widely and embrace that wider and more diverse spectrum."

The chance to register your interest in Dare to be Digital closed on Thursday, April 2nd, but entrants have until Sunday, May 3rd to submit their final applications.

Selected teams will have until August to create a finished prototype, which will be showcased in Dundee during the Dare ProtoPlay festival. Unlike previous years, they will be able to develop these at their own university.

You can find out more at **www.daretobedigital.com** ■

Vlambeer to lead indie talks in Brighton

by James Batchelor

VLAMBEER CO-FOUNDER RAMI Ismail will lead the indie content at this year's Develop: Brighton conference.

The influential developer will be delivering the Indie Keynote on Thursday, July 16th, where he will offer insight into the changing trends of independent development, drawing on his own experiences with titles such as *Ridiculous Fishing* and *Luftrausers*.

Ismail is a notable figure from the independent development scene. As well as his work at Vlambeer, he created the presskit() tool many indies use to provide info on their games. Last year, he picked up the Micro Studio accolade at the 2014 Develop Industry Excellence Awards.

The keynote will kick off the conference's fifth Indie Dev Day, a full-day of talks and networking events aimed at independent studios, start-ups, students and established games-makers considering the switch to indie development.

There will be five indie sessions in addition to the keynote, including a talk from Nyamyam's Jennifer Schneidereit on the development of *Tengami*, an adventure game set inside a Japanese pop-up book – and what it taught her team about standing out in a mobile world dominated by swathes of free-to-play titles.

At the time of writing, a full round-up of the Indie Dev Day talks is due soon.

Indies will also be given a dedicated space at the Develop Expo, with ten unpublished titles selected by a panel of experts and showcased to attendees.

Finally, a bootcamp of free sessions will run alongside the main Indie track.

Develop: Brighton 2015 marks the tenth year of Tandem Events' conference, with the organisers promising numerous new voices and first-time speakers to keep things fresh.

The conference will, as always, coincide with the Develop Awards, which will take place on Wednesday, July 15th.

You can find out more information at **www.developconf.com**.

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DEVELOP DIARY

Your complete games development events calendar for the months ahead

AT A GLANCE

APRIL 14TH
Mortal Kombat X
NetherRealm's flagship returns, as do the vicious Brutality finishing moves.

APRIL 21ST
Develop Awards deadline
Send nominations to developawards @nbmedia.com before 5pm UK time.

APRIL 23RD
Avengers: Age of Ultron
Assembling in Europe first. In your face, America!

APRIL 26TH
London Marathon
Watch as runners push their limits from the comfort of your sofa.

APRIL 29TH
Broken Age: Act 2
Tim Schafer's crowdfunded adventure game is finally complete.

APRIL 30TH
Question Time: Election special
Take time to see the potential future leaders of our nation duke it out.

DIARY DATES

Quo Vadis
April 21st to 23rd
Berlin, Germany
www.qvconf.com

APRIL

GADGET SHOW LIVE
April 7th to 12th
Birmingham, UK
www.gadgetshowlive.net

COUNTERPLAY
April 9th to 10th
Aarhus, Denmark
www.counterplay.org

MCV AWARDS
April 16th
London, UK
www.mcvawards.com

REBOOT DEVELOP
April 23rd to 25th
Dubrovnik, Croatia
www.rebootdevelop.hr

MAY

INTERFACE
May 14th
London, UK
interface@nbmedia.com

CASUAL CONNECT ASIA
May 19th to 21st
Singapore
asia.casualconnect.org

NORDIC GAME
May 20th to 22nd
Malmö, Sweden
www.nordicgame.com

DIGITAL DRAGONS
May 21st to 22nd
Kraków, Poland
www.digitaldragons.pl

EVENT SPOTLIGHT

INTERFACE

ALL STUDIOS – WHETHER the new wave of indies and micro studios or established names – face a challenge: getting funding, investment and exposure for their work.

This is an important block for new studios, over half of which consist of just four or less staff, and contributes to stats that say 50 per cent of digital start-ups fail in their first three years.

Taking place at London's Candid Arts Trust on May 14th, Interface will redress the balance, offering a structured day-long event that includes: private one-to-one meetings introducing creators to investors, publishers and new partners; exhibition and demo space in a public gallery; breakout sessions on access to finance and growing your business skills; plus a live-stage chaired by the teams behind *MCV* and *Develop*.

"Connecting the UK's creative talent with the budget-holders who want to help make them a success."

Key to the day is the Interface Meeting System, which will connect developers with potential partners. Everyone who registers is guaranteed some good introduction meetings throughout the day in our private area. Schedules are available to collect on the morning of the day itself.

Interface wants to connect the UK's great creative talent in interactive entertainment and video games with the budget-holders who want to help make them a success. The organisers will invite leaders in financing and investment, plus publishers and also the press to help offer further exposure to the UK's games creators.

Contact cnangle@nbmedia.com for more information about sponsorship packages, expo space and delegate deals. ■

COMING SOON

DEVELOP #160
MAY 2015

- **Localisation special:** How to open your game to a worldwide audience
- **Character modelling and animation:** Tips, tricks and the best tech

DEVELOP #161
JUNE 2015

- **Games marketing, reach and discoverability:** An issue packed with special features looking at the best way to get your games to market and into the hands of players

For editorial enquiries, please contact jbatchelor@nbmedia.com
For advertising opportunities, contact cnangle@nbmedia.com

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//COMMENT: BUSINESS

The King of advertising

Nick Gibson analyses the marketing strategies of the casual games giant behind Candy Crush Saga

King spent more on TV advertising than EA and Activision last year, which partly explains the world-conquering success of Candy Crush Saga (Main)

2014 PROVED TO be a record-breaking year for mobile games firms for many reasons. One that caught my eye came from the UK's annual games marketing spend league table. According to ad specialists Media Campaign, the biggest marketing spend for games software (as distinct from hardware) last year across all media types was made by King.

Yes, King spent more on individual games marketing than any console games publisher. This month, I want to explore what King's ascent to the ad spend throne ahead of the retail publishers says about the state of the mobile games advertising market.

A quick dissection of the financials for King, Activision and EA in recent years reveals some notable marketing spend differences. Activision and EA invested around 14 per cent of their revenue in the 'marketing and sales' cost category in 2014 – figures that are pretty typical in their recent history. To support its hyper growth of the last three years, King has spent between 34 per cent and 20 per cent last year.

Is this a radically different approach to game promotion? It would not be a huge surprise given that these are publishers targeting different market segments. Critically, even taking into account its higher marketing percentage, King is still much more efficient than Activision and EA with operating profits of 33 per cent vs 25 to 26 per cent for Activision and EA. King, therefore, has more margin to play with. But are they all that different in practice?

TELEVISED ROYALTY

Using the microcosm of UK games marketing spend last year we can see that King, Activision and EA all invested most heavily in TV ads. Remarkably, King spent more on TV than Activision and EA combined.

As a company that has grown aggressively using directly measurable customer acquisition strategies, the massive use of such a traditional, blunt marketing instrument might surprise. However, there is evidence from App Store data that TV ads can drive huge downloads. Such promotion is difficult to measure accurately but for King, this appears to be acceptable and the relative consistency of their TV ad spending in the UK throughout 2014 suggests it is also effective.

Many of the top grossing mobile games publishers such as King, Supercell – who also feature high in the same TV spend charts – and Machine Zone appear to have crossed a Rubicon in the last 18 months. They have apparently reached a point where direct customer acquisition is not enough to maintain their chart placement, install rate and – ultimately – their revenues. Broadening mass brand awareness and reach are the next logical step. Hence the enlisting of high profile actors and models, premium Super Bowl ads and giant billboard campaigns.

> ***"The use of such a traditional marketing instrument might surprise but there is App Store data that shows TV ads can drive huge downloads."***

Of course, we've seen this all before with the big console games publishers who have regularly used mega-budget cross media campaigns to drive title awareness and retail sales. However, the parallels between console and mobile games publishers don't stop there. The top mobile players all invest very heavily in performance marketing and direct customer acquisition too. This has often driven up ad prices out of the reach of many companies in the tiers below them.

The economics may not always make sense in the long-term for them but this will be seen as an affordable sacrifice if the result is continued chart dominance in the short-term. For me, this is reminiscent of the major retail games publishers using their scale to dominate shelf space and point of sale promotion – which, in a physical retailer, is always going to be at the expense of the competition.

In the retail space, this has contributed materially to the collapse of the mid and lower tier console games market and a concentration of power at the top. Will mobile gaming follow suit or will its infinite shelf space and theoretically lower barriers to entry prevent this from ever happening?

One could argue that for the lower tier of mobile gaming, this has already happened – although many more factors than ad spend by the top tier are responsible. Perhaps the greatest threat could come from top tier publishers saturating not just the top but also the middle of the charts? How long will success in the mid-tier, which remains vibrant and viable, if the chance of cracking the top 50 becomes increasingly difficult? ■

Nick Gibson is the commercial director of Gunjin Games, a mobile and tablet games studio staffed by veteran developers based in Brighton, UK
www.gunjingames.com

//COMMENT: INDIE

Enough! Why Team 17 Is no longer 'a publisher'

Debbie Bestwick explains the next evolution for the UK firm

LAST TIME, I wrote about the new world of indie development and self-publishing and how the move into it disrupted our internal development. Now I'd like to focus on how being responsible for our partner's games has made us look again at how we operate.

Publisher. Horrible word isn't it?

For many of us, it brings back memories of milestones being rejected for spurious reasons; IP being grabbed or stolen; projects being cancelled "for convenience"; people who've never played games demanding wholesale changes; schedules being mutilated because "we need to hit the quarter"; the list goes on.

The bad news is that's just development. Once what's left of 'your' game is finished, you find projects that you were promised were going to be "fully supported" suddenly being relegated to catalogue fillers; lifecycle management being "we'll throw a bunch of copies out and slash the price if you don't meet our sales expectations". Oh, and those changes that were forced on you? They've dragged your Metacritic rating down, but now that's your fault and the publisher doesn't want to work with you again.

Publishers? Pah! Who needs 'em?

But the sad truth is most games creators do need someone to help out. Whether it's with marketing and PR, localisation and QA, real lifecycle management, building communities or anything that gets in the way of actually making the game. They just don't need 'a publisher' and all the old ways of thinking and the other baggage it brings.

When we first started working with our partners on *The Escapists, LA Cops* and *Beyond Eyes* – three games a traditional "publisher" would never touch – we deliberately called what we were doing an Indie Support Program. It didn't seem like the old view of publishing. As we've released our first few games and signed more, we've taken a long, hard look at what we want to achieve and how we want to go about it, resulting in this manifesto:

■ We're here to help, to advise where requested, and to enable our partners' great ideas to come to life.

> ***"Most game creators need someone to help out. They just don't need publishers' old ways of thinking and other baggage."***

■ It's not about us, it's about the people we work with and their games.

■ It's your idea. IP is the most precious thing our partners have – and it's theirs, always.

■ We fully believe in every partner, and give 100 per cent in helping realise their potential.

■ We do what we do best – marketing, QA, lifecycle management, and so on – and let our partners get on with making games.

■ If our partner needs help, we offer it: dev resources, tech support, office space, anything.

■ We show our partners where every penny we spend on their game is going, and give them sign-off/veto rights if they don't agree.

■ We help our partners become self-sustaining. The starving artist is a lovely romantic ideal, but not a nice reality.

Throughout the history of music, there have been those that help bring new forms of creative expression to audiences – even if that means going outside the "way things are done". Labels such as Sun and Motown have shaped the face of their industry – which is exactly what we want to do.

So, as of today, Team17 isn't a publisher but a label. We hope it's the start of a revolution. And if it results in a few publishers' heads on spikes? Well, they were warned… ■

Debbie Bestwick is CEO and one of the founding members of Team17. She pioneered the company's leap into digital publishing.
www.team17.com

Beyond Eyes (above left) and LA Cops (above) are games traditional publishers would never have touched, but receive more support in today's indie-friendly climate

//EXTRA CONTENT ONLINE

"ID@Xbox made it easier, but for us, going through certification or 'cert' was one of the most daunting tasks we ever faced."

The give and take of ID@Xbox
Joe Brammer, Deco Digital
deve1op.net/1Go8jK0

"A lot of devs have heard of Twine, but don't know much about it. They have heard of *Depression Quest*, but that's the extent of their knowledge."

What is Twine?
Liz England, Insomniac
deve1op.net/1wSdTUw

"Developers can choose the path they want to take. If they just want to release a game, and they don't feel they need Xbox Live, that's fine."

Xbox's evolving indie strategy
Agostino Simonetta, Microsoft
deve1op.net/1x8mlzi

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Graduate Engineers

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GATEWAY TO CHINA
Android platform MHT Game is looking for Western partners

Testing times for **broken games**

The recent spate of bug-ridden triple-A blockbusters has put the entire quality assurance sector under the microscope. **James Batchelor** asks QA experts to explain the full repercussions

WHEN SOME OF the biggest games of 2014 arrived on shelves, it was not their groundbreaking features nor their sales success that had the industry talking. Instead, it was corrupt and freakish character models, or highly cumbersome, nigh on inoperable online functionality.

The problems experienced in *Assassin's Creed: Unity*, *Halo: The Master Chief Collection*, *Driveclub* and more called into question the quality standards to which the development community holds itself. Even when the dust had finally settled, issues around the recent release of Xbox indie title *Ori and the Blind Forest* brought the debate around launch quality of today's games back to the fore.

Develop spoke to QA experts from around the world to ask the most pressing question: why are there so many broken games?

"Testers need to be given a fair amount of time to perform their checks, which have to be scheduled into the right moments of the development workflow," says Adriano Majocchi, lead testing co-ordinator at Synthesis.

> ***"The time between a fully testable build and the project's deadline is often squeezed to a minimum."***
>
> Andriano Majocchi, Synthesis

"The time window between a fully testable build and the project's deadline is often squeezed to a minimum. When this happens for large and complex titles, the consequences for the final release are obvious to anyone: functional bugs – known and not known – will undoubtedly slip in."

Tight deadlines are one of the most common complaints when it comes to QA, as well as budget cuts that often target the testing process first. Of course, the reasons behind these is well documented.

"Launch dates are announced well in advance of completion, and may be tied to marketing campaigns or product tie-ins, so development has to meet those dates," says Scott Ferguson, senior test manager at VMC. "Fortunately, the timeline for quality is more flexible now that publishers have the ability to make improvements post-launch."

Bug Tracker's Jonathan Villanueva says the fact that most of today's console games build on established franchise mechanics may be deluding devs into thinking bugs fixed in previous iterations won't reappear.

"When much of the gameplay is continuously recycled from previous titles, one would think the quality would just

Synthesis' Andriano Majocchi (above) says tight deadlines for large and complex titles like Assassin's Creed: Unity can result in unexpected errors (main)

Above, top to bottom: Pole To Win's Katsuri Rangan, VMC's Scott Ferguson and Universally Speaking's James Cubitt

Main: Testing teams, both internal and external, may be able to identify bugs and glitches but they don't always have the time or authority to resolve them

improve instead of the other way around," he says. "But products like these are rushed through the pipelines and limited in resources."

This is not helped by the more ambitious designs of triple-A games. Majocchi says the growing popularity of open-world games, for example, means comprehensive and thorough testing is "virtually unachievable".

Consumers particularly expect quality from both franchises and developers that have long since established themselves.

"When you take a successful series, player expectations on game experience get higher year-on-year," says Katsuri Rangan, director of operations for QA at Pole To Win. "But enhancing the visuals or gameplay and failing on the quality of the player experience is a failure for the overall product."

Majocchi adds: "When the culprit is one of the big names in the gaming industry it does somehow put the rest to shame. Personally I think that, in the long-term, the integrity of the gameplay experience could and should create a new area for competition. The top video games should have to excel."

BROKEN BLOCKBUSTERS

VMC's Fergusson points out that the problems suffered by 2014's triple-A hits aren't necessary new – they're just much better publicised.

"Not long ago, a user who had issues would have to purchase auxiliary equipment to capture their experience," he says. "It required additional cost and effort, so fewer users publicly promoted these issues. Now there's a Share button at our fingertips.

"Every experience – positive or not – can be easily documented or streamed. Issues become mini-celebrities, people follow conversations about a particular bug. The ease of sharing gives the bug more exposure, but that visibility doesn't correlate to how well games are tested."

Universally Speaking's QA manager James Cubitt agrees, adding: "I like to believe that the industry's quality standards are much higher, which is why these issues get so much press. They are not the norm."

When so many titles are lampooned so publicly for their noticeable glitches, calls for accountability multiply – but they aren't always aimed in the right direction.

"The general perception is that blame falls on QA," says Rangan. "Sadly in most firms today, they are detection robots, who are only responsible for finding issues and don't have the authority to resolve them. QA teams might have detected most of the critical issues in these titles, but were refused to be fixed due to launch targets."

Villanueva adds: "If a game is sold with bugs, the developer or publisher looks to the QA team, whether in-house or outsourced. If outsourced, the QA companies are blamed for a poor quality of service. However, they tend to forget the rush in which the projects are often tested, the limitations of deadlines and budget cuts, and the constant rotation and changes in testing team sizes."

Sharif Sakr, business development director at GameBench, says consumers are becoming more savvy about the industry's processes. They suspect – correctly in some cases – that testing is done "at the absolute last minute" but maybe not understand the commercial pressures behind this.

> ***"Indies want to make sure people are talking about the game, not the game's issues."***
>
> Scott Ferguson, VMC

"In some cases, gamers are also aware this happens because certain titles are trying to push boundaries and max out the capabilities of the new consoles," he says. "This is fundamentally a good thing, even though it's no excuse. *Assassin's Creed: Unity* might be an example of that: its ambitious AI would have increased development time and reduced testing time, while also lowering frame rates and causing a shaky experience."

QUALITY ON ANY SCALE

This is by no means solely a triple-A issue. Even small or medium-sized teams face problems if their game is flawed.

"Indie developers have a different pressure," Ferguson says. "They may not have another release coming out next quarter or even next year. With all of their eggs in one basket, they have to make sure their game is as good as it can be.

"Lower-end games also don't have the same budget scale for rigorous QA. It's hard to compete with the big releases, so they want to make sure people are talking about the game, not the game's issues."

GameBench's Sakr adds that mobile devs are also subject to this: "If you look at low-end mobile games in the Google Play Store, you'll see upset reviewers complaining of poor frame rates, excessive battery drain rates, and compatibility issues on their devices.

"If you look at user reviews of games that push mobile devices to their limits, such as *XCom: Enemy Within*, then you come away with the impression of a disconnect between what gamers expect and what mobile games currently deliver.

"The maturity of the PC market – where everybody understands the connection between hardware and performance – is totally absent in mobile, and better QA is just the beginning of a solution."

BETTER TESTING

There are, of course, new paths testers can take that weren't available years ago, but these are to be approached with caution. Case in point, Villanueva says, is the rise of automated QA tools.

"While automated tools can to a certain level find a large number of bugs, it is only the human factor involved during gameplay that triggers identification of unique bugs often missed during QA," he said.

QA specialists are far more optimistic about the use of Steam Early Access and other forms of beta testing to help not only identify faults, but also raise consumer awareness of the battle testers are fighting.

"Early Access titles show the end user how long it takes to test, and fix the smallest of issues," says Cubitt. "This insight into the process that can only be good. It is very important the user understands the amount of work and time that is devoted to each and every title that is produced."

Sakr agrees: "I think Steam's Early Access program has helped developers deal with bugs and glitches, as have the various beta phases on consoles. That's why I think

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Above, top to bottom: GameBench's Sharif Sakr and Bug Tracker's Jonathan Villanueva

Main: The online issues of Halo: The Master Chief Collection (above right) and even smaller games such as Ori and the Blind Forest (right) have prompted other developers to delay their titles, including CD Projekt's The Witcher III (below right)

external testing services are important for mobile, because the app stores aren't really set up for beta testing and because hardware fragmentation means testing needs to be conducted on quite a broad scale."

Several major developers have decided that the best way to secure more testing time is to delay their games. Rocksteady's *Batman: Arkham Knight* and CD Projekt's *The Witcher III* have both been pushed back by several months. The latter studio has even told the press that the market is now "afraid of badly polished games".

Cubitt commends this strategy: "You never know the state of the title is until it comes to the end of the development cycle. A best case will be estimated, but with new engines and game complexity, the time required for testing can soon spiral depending on the number and complexity of the issues being reported.

"A delay is a small disappointment to the end user, but much better than having issues affecting gameplay on release."

> ***"Our QA standards aren't really keeping up with the increasing complexity of the games we are creating."***
>
> Sharif Sakr, GameBench

Ferguson argues that video games are one of the few forms of entertainment that can benefit from it: "If the film is delayed, that can have a huge impact on sales. But if a game release is delayed, that often builds buzz and generally results in improved quality. The title can have more financial and critical success despite a delay. It's really a shift in protocol as companies see the return on investment that comes with extra polish."

THE POWER OF PATCHES

The increasingly connected nature of the new consoles means it is at least possible to fix a broken game after launch. Ubisoft set up a website where users could keep track of the team's progress as fixes were issued for *Assassin's Creed: Unity*.

However, Synthesis' Majocchi argues the day one patch is "abused" by some developers, while Cubitt is stresses that studios need to become less reliant on them.

"Before this was possible, you had to ensure the release version was virtually bug free," says Cubitt. "This meant a number of delays could be expected with titles, but the need for release day patches was non-existent."

Rangan argues that reliance on day one patches is just the tip of the iceberg.

"Modern day games are 1,000 times more complex than games made 25 years ago, but the majority of developers still stick to old school planning strategies," he says.

"We need a mindset change across our industry. The only standard that we should set should be offering the best possible player experience within costs allocated for production. Everyone owns quality: the producer, the VP, the CEO, the studio head, artists, developers, testers. Anyone and everyone should think about how they can give the player the best possible experience in the budget they planned."

Villanueva agrees: "We need to raise the bar for quality standards, which is already the first problem. While the industry has evolved incredibly in the last ten years, the level of quality in the products has reduced at the same rate because of the economy-oriented nature of the business.

"QA is not only about making sure the game works, but also about making sure the game is a playable, entertaining and satisfying product."

QA firms stress that this needs to be addressed now. The high-profile problems of *Assassin's Creed*, *Halo* and *Driveclub* have left a bitter taste in many gamers' mouths and mean future releases will be under intense scrutiny.

But greater accountability and higher standards of quality are only the beginning. With new technology on the way, developers need to be able to efficiently deal with traditional bugs and glitches in order to dedicate more time to the unexpected issues that will arise from future platforms.

"Our QA standards aren't really keeping up with the increasing complexity or immersiveness of the games we're creating," says Sakr.

"As PC games push into virtual reality, and as mobile games become more console-like, then not only does QA become technically harder, but it also becomes more critical, so that the player's sense of 'being there' isn't shattered.

"It's perhaps analogous to how make-up departments had to keep up as movies started shooting in HD and then 4K – except that I think it's even more critical in games, because no movie-watching experience can ever be as immersive, or vulnerable, as a good gaming experience." ■

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Keeping up **quality**

Increasingly games are no longer developed just for the short-term, but are built with an extended lifespan in mind. **Craig Chapple** asks the experts how to deal with the constant testing required for games made to last

Testronic's head of QA Erik Hittenhausen (above) says teams need to be vigilant for ever-changing platform holder requirements that may occur at short notice

Main: Bigpoint's DarkOrbit Reloaded is one of a number of online games that receives weekly updates that will require QA

AS WE'VE SEEN in the previous article, it is becoming more and more difficult to develop large games and release them bug-free. Another challenge developers are facing, particularly on mobile and now on other platforms, is releasing constant updates to a live game.

This can go on for months or years, and throughout this time each change and addition needs to be tested to ensure it's not broken and also doesn't break anything already established in the game.

These updates aren't just on a monthly basis; they can be weekly, too. So keeping organised and planning ahead is paramount to ensure a smooth release. The world's most popular games, such as *League of Legends*, *DOTA 2* and *Clash of Clans*, have regular updates and are played by millions, and small issues could quickly become big problems.

PLAN AHEAD

Bigpoint's director of live games Nina Müller says for its titles, such as *DarkOrbit Reloaded*, the weekly release cycle means the QA teams have to keep agile in terms of planning and execution, and they need to be sizing and preparing for other upcoming releases.

"In many occurrences there are multiple updates that are being developed in parallel," she says.

"This can add a lot of strain to the QA team and we do a lot to minimise this strain by creating good relationships between the code, production, design and QA teams to make sure all the stages of the development are seamless and nothing unexpected occurs. We are also implementing QA at much earlier stages of development to get a forward-look at any potential issues that may arise."

> ***"There are often multiple updates being developed in parallel that can add strain to QA."***
>
> Nina Müller, Bigpoint

VMC's manager of live game operations Ryan Cloutier echoes Müller's sentiments that releasing new content in a live environment can increase the testing requirement exponentially, as each release needs to be verified against existing content. It's important to discover bugs quickly before players find them and exploit them for an unfair advantage.

"Quickly identifying and addressing user feedback is why the hybrid QA/live game operations support model is increasingly relevant," says Cloutier. "QA and live game ops have a cyclical nature – as need for one rises, need for the other eases – so the hybrid model allows resources to focus on the issues that will keep people engaged with the game. The hybrid model makes these challenges more manageable."

ETERNAL QA

The adoption of 'games-as-a-service' is completely changing how games are made and their longevity. Rather than throwing them over the wall like traditional, top triple-A releases, developers now work on games for years, steadily building their communities.

This means keeping up the game's quality and providing a consistent, smooth experience is of paramount importance. Testronic's head of QA Erik Hittenhausen says there are significant risks associated with breaking a live environment, including the negative social media that can blight a game – even if its problems are only temporary.

"QA needs to be vigilant for ever-changing platform holder requirements and the hardware landscape; as long as your game is live you need to continuously monitor these things," he explains.

"You may have been compliant and compatible when the game first launched

but that can quickly change. If a user has a problem running your game on the latest and greatest smartphone, in their mind it probably reflects badly on your game rather than their cutting edge device."

He adds that continuously testing throughout ongoing development is critical, and offers some advice.

"They key is to look for efficiencies in our QA approach; what aspects of the game could be affected by the changes in this update?" he states.

> ***"To be taken seriously in eSports requires the consistency to maintain a level playing field."***
>
> Ryan Cloutier, VMC

"While the core features and functionality of the game should be tested and re-tested during every release cycle, it may become impossible or simply not economical to exhaustively test all content in the game for every release cycle. Understanding what content is new, changing or could impact existing content and designing your test approach accordingly is very important."

Despite all manner of testing, sometimes bugs can still make it through even the most stringent of QA, and it's important to react quickly. Hittenhausen says it's important to take the quality of your game as seriously as you would take your paying customers.

However, Cloutier says that while it's better to address problems as soon as possible, it can be problematic to constantly issue hotfixes instead of patches. He also stresses the importance, particularly for competitive and eSports games, to address player concerns.

"If you want to be taken seriously in eSports or as a competitive game, you have to have the consistency to maintain a level playing field," he says. "Customer expectations are higher than ever."

ASSURING QUALITY

QA firms have had to adapt to these industry changes, ensuring they have enough staff to test games before and after release. Enzyme's senior project manager Steve Paquin says one of the main pillars for live game testing is the customer support for which testers with necessary knowledge of the game will provide post-release support to end users.

"Users will enter tickets in a database and the customer support testers will usually have access to the back-end and will be allowed to fix most of the cases that don't require coding support of anything regarding currency," he says.

"We also have focus groups with teams composed of very specific profiles that will help and provide guidance to game developers and publishing about aspects of their games to hit their targets. Aspects could be their business model, the in-game monetisation, user retention, game balancing review, etcetera."

Cloutier says that, in addition to QA, VMC offers in-game support, community management and global beta testing. Its global beta test network is designed to test a game in real-world conditions.

Testronic meanwhile has launched a new Smart Support service, designed to provide constant customer support and feedback to the publisher on core in-game issues.

Even studios like Bigpoint are adding their own new internal measures for QA. Last year the firm implemented a Community Bugging Platform that is available to board admins and moderators to enable quicker reaction within QA from community found issues.

CROWD-TESTING

But while all these QA firms have been expanding their services, why not just use player feedback to identify and fix issues? For example, Steam Early Access has proven a great method for developers to build a game that players will want to play, at the same time getting player opinion on the key issues affecting them.

Paquin admits that no amount of testing will ever beat tens of thousands of users, but says QA professionals will be able to make sense of the fire hose of information.

"As the industry evolves, developers are starting to use more complex tools to generate metrics and logs that will provide them with important details that will help fixing the issues," he says.

"First parties have very specific and severe standards that need to be respected and tested using development kits that are not available to the public. While the players can provide feedback and also report issues, especially during open beta testing, the QA support and expertise will always be sought by development and production team as they are reliable sources with defined methodology, technical test approaches."

Pole to Win marketing manager Regina Walton says there is a key difference between players and those that service providers hire.

"Feedback is part of quality assurance and should be shared proactively," she says.

"The best testers will have to detect as many defects as possible and be able to describe quickly and clearly. Achieving this is not a simple task and sometimes takes years to master." ■

Top-to-bottom: Bigpoint's director of live games Nina Müller and VMC's manager of live operations Ryan Cloutier

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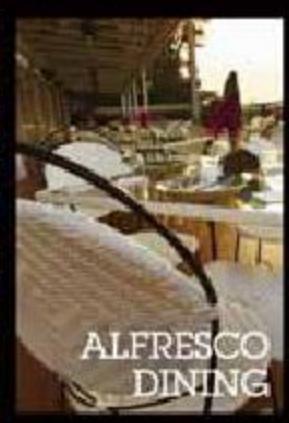

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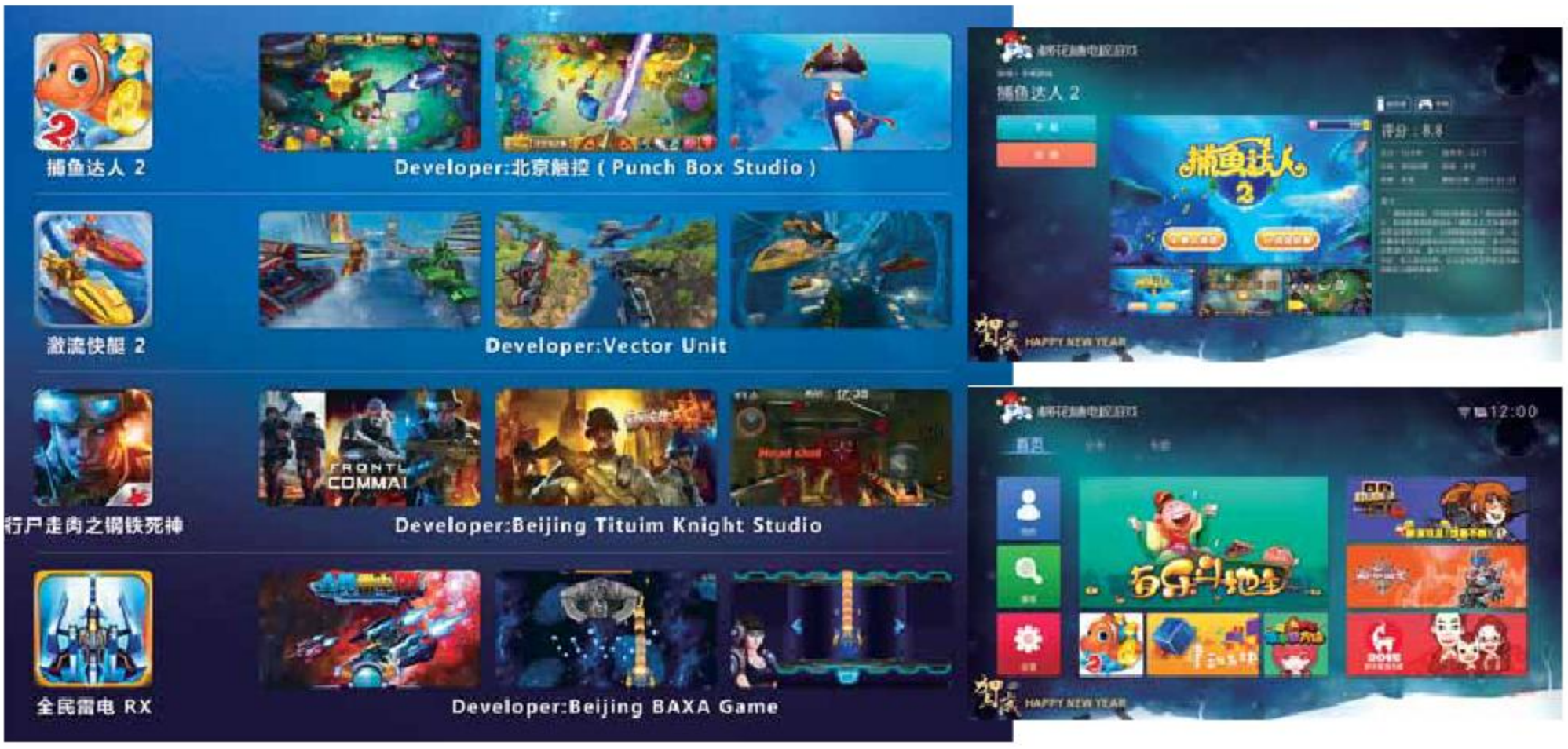

Gateway to **China**

With new opportunities arising in the East, one company is keen to meet more developers from the West: MHT Game

THE CHINESE GAMES market is markedly different to that of any Western nation, or even some of its neighbours.

Until last year, the most notable difference was the console ban, a long-in-place piece of legislation that prevented Nintendo, Xbox and PlayStation selling their products in China. In the face of this unique barrier, other models and forms of gaming have arisen.

One such alternative has been gaming through set-top boxes and other digital devices, with MHT Game positioning itself as one of the leading and fastest growing platforms in the sector. The firm specialises in the digital distribution and publishing of Android-based games via set-top boxes, Smart TVs and other Android-based devices that centre around the television.

Co-founder Edward Qu tells us the firm's offering is historically geared heavily towards Chinese consumers: "Currently 80 per cent of the games on MHT platform are from Chinese IP. Games available on our platform are mainly family-oriented games with Chinese elements such as local music, language and characters. Collaborative play is also very popular."

However, MHT Game has managed to bring some Western-developed but globally popular titles to its platform – including PopCap's *Plants Vs Zombies* and Vector Unit's *Riptide GP* racing series – and it's keen to expand on this.

"China is two decades behind the West for TV-based games due to the shut out of console games and hardware," explains European business development manager Gerry Berkley. "Now that the Chinese government has lifted the ban, our objective is to bring the gaming experience back into the China family living room.

"We know that European developers have an excellent track record of creating exciting and innovative products. We are looking for partners who are experienced with family-oriented games and are prepared to fully embrace the opportunity to break into the Chinese market.

> ***"China is the last big market to target. There is a population that can now afford to invest in games."***
>
> Gerry Berkley, MHT Game

"We are offering partners who collaborate with MHT Game a window into a market that can provide them with an additional revenue stream, as we jointly benefit from the market growth."

The company wishes to maintain the family-friendly nature of its games library, seeking titles that are suitable for young children, as well as racers, action games, cartoonish shoot-'em-ups, sports titles and casual games.

Qu believes the lifting of the console ban marks a new era for his home market, and while a lot of people's focus will be on the three consoles finally making their way to shelves, the increased attention should benefit firms like MHT.

"It's good news for everyone involved in video games," he said. "Our view is that the entry of the major console format holders will boost the awareness of the Chinese video games market opportunity."

He adds that, while releasing games in the East can be a daunting prospect for Western devs, MHT Game is eager to make the process as accessible as possible.

"We are very keen to work hand-in-hand with our publishing and development partners for language and technical support," he says. "We can also offer a full localisation service.

"Ultimately we would hope that developers consider a release on our Chinese TV gaming platform when they are developing new IP."

Berkley stresses that this represents a major opportunity for developers – particularly smaller ones – to establish themselves in a relatively new market. With the mobile and PC marketplaces being so crowded, and consoles still largely dominated by triple-A games, Eastern games platforms offer a fresh alternative.

"China is the last big market to target," he says. "There is a rapidly growing middle class population that can now afford to invest in new gaming platforms."

MHT Game is keen to hear from developers interested in bringing their titles to the company's platforms. To find out more email gerry@mhtgame.com in the UK or edward@mhtgame.com in China. ■

Top to bottom: MHT Game co-founder Edward Qu and European business development manager Gerry Berkley

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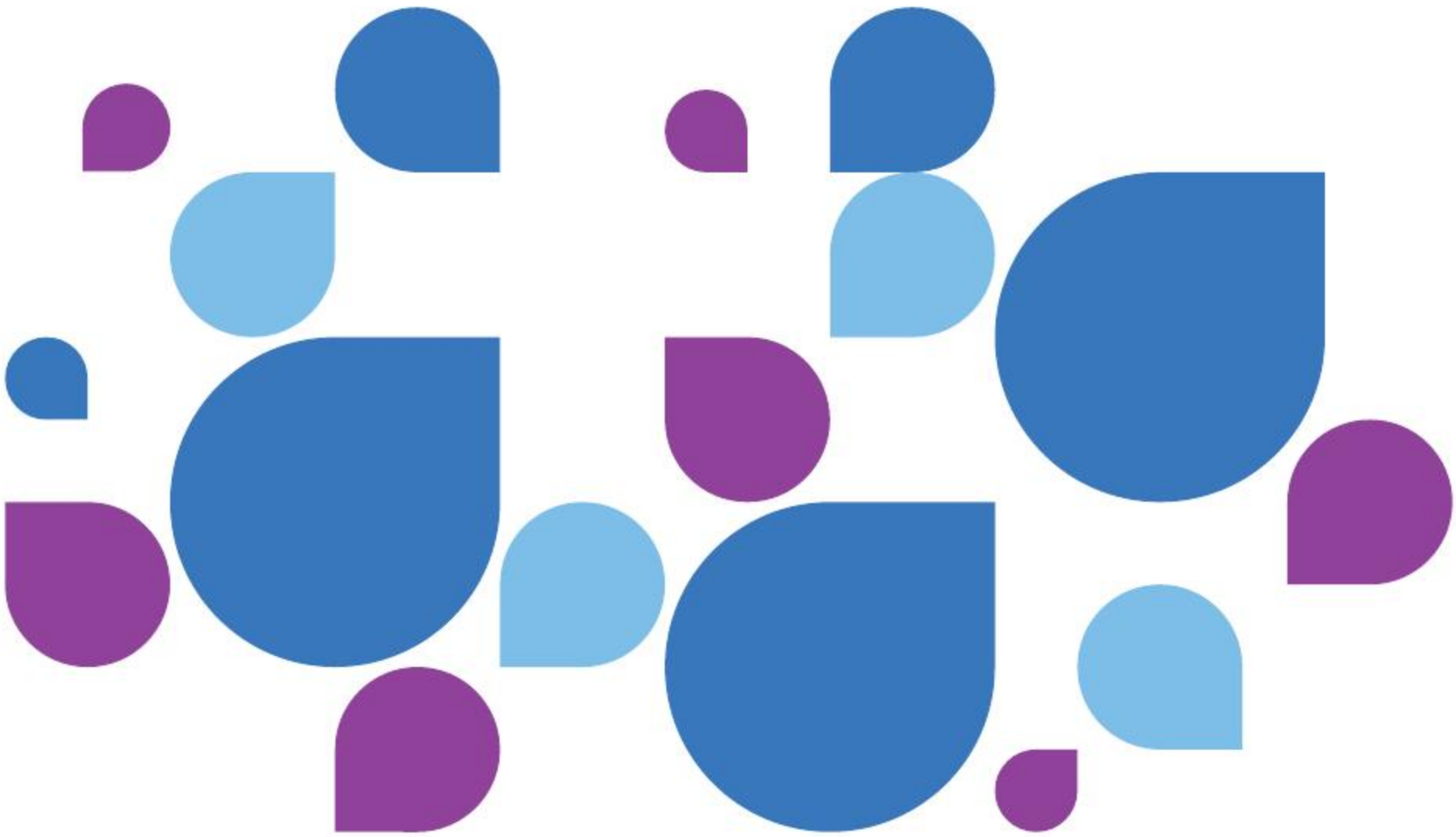

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Curve co-owner Jonathan Biddle departs to form new indie studio OneBitBeyond

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RECRUITER HOT SEAT

Engine Room Games' Alex McLean on the firm's recruitment needs

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GET THAT JOB

Reflections' Darryn Robson talks about becoming a gameplay lead

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Playground Games ramps up for next big project

Following the success of last year's Xbox-exclusive racer Forza Horizon 2, Playground Games is on the look-out for fresh talent for its new project

By Alex Calvin

LAST YEAR PLAYGROUND Games developed and shipped Xbox-exclusive *Forza Horizon 2*.

Rather than employ the traditional 'hire and fire' strategies some studios are known to use at the start and end of projects, Playground wants to keep its core developers – and it has used contractors to give them that flexibility.

"We like to keep our best people – it's hard enough to find good people without seeing them walk out of the door at the end of a project," Playground's head of talent Alex Wright-Manning tells *Develop*.

"Contractors give us flexibility, and they know the end of a project is the end of their term. We went down again, but most were contractors.

"We like to have a solid core team of full time professionals who will come and work with us for many years. But to mitigate that boom and bust, we have a number of contractors to do that work."

Now the firm is preparing for its next title, and is on the hunt for new talent to get it started.

> ***"We're mainly looking for senior and lead positions, but we're also opening our doors to graduates."***
>
> Alex Wright-Manning, PG

"We're hiring for a pretty broad spectrum to be honest," says Wright-Manning. "We're looking for people right across the board. We're ramping up for our new project following the success of *Horizon 2*, so we're mainly looking for senior and lead positions. But we're also opening our doors to graduates this year. It's a really broad spectrum in terms of what we are looking for.

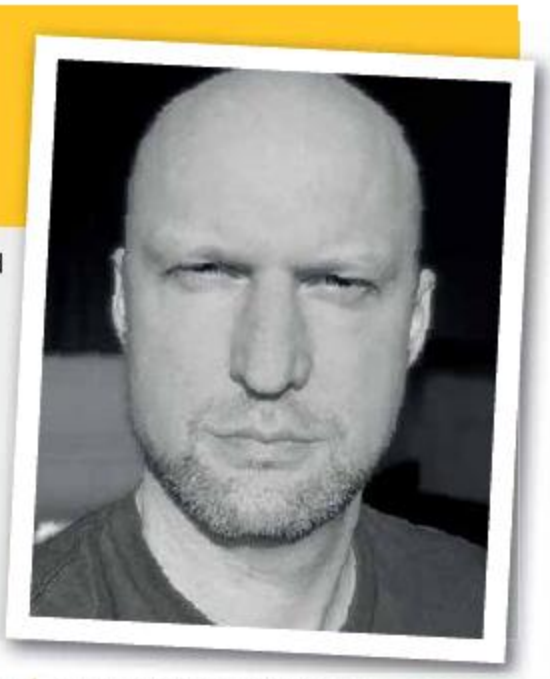
"As a company we've been continually evolving, growing our world class team year on year. We've got a lot more responsibility and pressure on us, working on new-gen stuff that requires more skilled people. That's why we are looking for senior people, particularly on the content creation side of things. As the team gets larger, we have to produce bigger games. Having seniors and leads in position just helps the rest of the team and makes us a more efficient unit when producing games."

Playground is also keen to nurture new talent, and Wright-Manning has some tips for graduates applying: "Have strong examples of work, a real showing of your passion for the industry. We want to know what games you are playing, why and what you like about them. This is the stuff you are going to be asked during an interview." ■

MOVERS AND SHAKERS

This month: Curve Digital, Microsoft, Bigpoint, Scopely and Engine Room Games

CURVE'S BIDDLE LEAVES STUDIO, SETS UP OWN OPERATION



CURVE DIGITAL ■ Design director and co-owner **JONATHAN BIDDLE** has left the London studio.

Biddle worked at the firm for ten years and led development on the award-winning *Fluidity* and *Stealth Inc*. He has set up new studio OneBitBeyond, which will publish its games through Curve.

"I'm so intensely proud of the work I've done as part of the incredible team at Curve over the past ten years, and I'm hoping to continue creating games as fresh and exciting as those Curve made with my own studio for years to come," said Biddle.

"Having seen the intimate inner workings of Curve Digital's publishing as it has grown, I couldn't imagine trusting anyone more with publishing my future titles. I'm looking forward to many more years of working with Curve as OneBitBeyond."

Curve Digital managing director and co-founder Jason Perkins added: "Since we founded the company a decade ago, Bidds has led the teams developing titles which have not only achieved critical acclaim but have helped to define us as both a developer and a publisher.

"We're very glad that Bidds' new venture will allow us to continue working closely together." ■

MICROSOFT ■ The platform holder has promoted Kinect mastermind **KUDO TSUNODA**. He will now be looking after key Xbox studios in America and Europe, including the likes of Rare, Lionhead and Lift London.

Tsunoda will also continue working on Microsoft's new HoloLens tech.

"While the *Halo*, *Gears of War*, *Forza* and *Minecraft* franchises will continue to report to Phil Spencer, Tsunoda will lead the vision and experience development of our other Microsoft Studios portfolio investments in the USA, Europe and across our global publishing team," said Microsoft's Larry Hryb.

BIGPOINT ■ The online games firm has bolstered its live games management team with the appointment of **HEATHER SINCLAIR**, as head of product optimisation and **SHAWN LORD** as the new producer on *DarkOrbit Reloaded*.

"Heather and Shawn are the perfect fit for our international games teams", said Nina Müller, director of live games. "Heather's knowledge involves not only working with comprehensive, game-specific data sets, but also choosing the proper metrics and drawing the right conclusions."

SCOPELY ■ Mobile entertainment network Scopely has hired **ROY ROSENTHAL** as general cousel and head of business affairs.

Previously, Rosenthal was senior counsel and senior director of business affairs at Zynga. He also has run business affairs at music app firm Shazam.

"I hope Scopely can benefit from my experience and perspective from Zynga and Shazam – particularly from Zynga, which is operating in much of the same space as Scopely," he said. "While there, I built out the deal structure for Zynga's advertising business, third-party dev platform, IP licensing efforts, and general commercial deal flow."

ENGINE ROOM GAMES ■ The studio has recruited Codemasters veteran **ROBIN BRADLEY** to its Straford-upon-Avon office.

Bradley has worked at the racing studio for 15 years, most recently working as principal graphics engineer. At Engine Room Games he will be working as principal software engineer.

"We're delighted to have Robin join us," said studio director Alex McLean. "We've been looking for only the best graphics engineers so with his experience, Robin is an ideal fit. We have all kinds of interesting graphics and VR work to do and it's great to have Robin join that effort."

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Helsinki, Finland

www.housemarque.com

The Helsinki-based developer behind downloadable hits such as *Resogun* and *Super Stardust* now houses 53 members of staff. The office is divided into rooms named after the games it has made – and CEO Ilari Kuittinen's office is entitled 'Bossfight'.

RECRUITER **HOT** SEAT

Engine Room Games director Alex McLean on building a team focused on game engine development

BIO
Name: Alex McLean
Title: Director
Developer: Engine Room Games
Country: United Kingdom
www.engineroomgames.com

What differentiates your studio from other developers?
At Engine Room Games (ERG) we have specifically set about the goal of employing people who are the very best of the best. We like to take on the kind of developer that a typical games studio might have only one or two of – the star performers. There are a number of benefits to this.

Beyond building a team of the best people around, we find that developers of that calibre are very self-motivated and require little direction. They're usually more than aware of what needs to be done, and how to do it.

How many staff are you looking to take on?
In the short-term, we're looking to take on three further engineers, all working on projects relating to our partnership with Unity Technologies.

Essentially ERG is presently responsible for the development of Unity for PlayStation consoles and we're about to broaden this out into assisting with performance and graphics too. One position is for a very experienced principal graphics programmer. This role is at the highest level and we expect the work to take place on the cutting edge of video games and VR graphics development.

We are also looking for two further senior engineers to work across both development and support. These roles will see time split between active development of Unity and working remotely with developers worldwide as they use Unity.

What perks are available to those working at your studio?
One of the biggest perks, for the right developer, is autonomy. We expect our employees to work without micro-management and be able to spend their time working on complex issues in a vast array of problem spaces.

In terms of employment perks, we offer highly competitive salaries and benefits such as private health care cover that includes family members, pension, flexi-time and a generous holiday package.

What should aspiring devs do with their CV to get an interview?
Keep your CV concise and simple. Nobody needs a six-page CV. One or two pages is just fine. We want to know your skills, experiences and aspirations. What do you want to do and what do you most enjoy working on? Where possible, ensure your passion and willingness to learn comes across. To join ERG, a direct application is the way to go as it demonstrates both initiative and enthusiasm. We also don't presently use employment agencies.

Who is the best interviewee you have ever had and how did they impress you?
I've interviewed lots of great people but one that stands out from a previous company is an engineer who was working as a mechanic in the Air Force.

He'd taught himself programming and wanted to make the step into games development. His enthusiasm for the industry and the effort he was putting in to make a difficult career transition between two very different jobs was outstanding. He was very clear about what he wanted to do and came across well in interview.

> ***"Keep your CV concise. Nobody needs six pages. One or two is just fine."***
>
> Alex McLean, ERG

And who was the worst?
The absolute worst is difficult to call out, but we've seen a few curious characters over the years, including one who both answered his phone to a friend (while raising his hand to signal for us to wait) and unremarked, pulled out a Ginsters to tuck into, right in the middle of our questions.

Beyond specific interviews, the disappointing interviewees are those who simply haven't made even the most casual effort to establish anything about the company or role before visiting, and those who turn up woefully late with no good reason.

What advice would you give for a successful interview?
Get the basics right. An interview is about a company and an individual exploring their common ground to see if they have a future together.

Be honest about your skills and state what you want to do and what work excites you. Do some research and find out as much as you can about the company. Be confident about areas of expertise and acknowledge the areas you aren't so familiar with.

Nobody can be an expert in all areas of games development in the industry these days and it's fine to not know something. ■

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GET THAT JOB

Development specialists offer advice on how you can bag that career leap

THIS MONTH: DARRYN ROBSON, LEAD GAMEPLAY PROGRAMMER

What is your job role?
I'm a lead gameplay programmer at Reflections in Newcastle.

What qualifications and/or experience do you need for a job as a gameplay programmer?
On the technical side I'd look for a Bachelor's degree in a relevant subject or equivalent industry experience with one-to-two years commercial software development experience.

It always looks good when people have internships and industry experience on their CVs. A passion for games is something I look for; for example, participating in game jams and any activities that show commitment and teamwork, such as the Duke of Edinburgh Award Scheme.

How would someone come to be in your position?
Usual career progression is to work your way up through the ranks from junior to senior gameplay programmer. From Intermediate level onwards look for opportunities to mentor junior staff – your lead will be able to help you with this – and also look for opportunities to take leadership on some of the bigger gameplay features.

> ***"Passion is something I look for, such as taking part in game jams."***
>
> Darryn Robson, Reflections

What do you look for in interviewees?
Once we're past checking appropriate qualifications and technical tests I mainly look for a passion in developing games and a co-operative, supportive attitude.

What opportunities are there for career progression in Reflections?
Yes, there are opportunities to progress at Reflections and also within Ubisoft.

At our studio, the next step is not just about becoming a manager; you can choose if you want to develop as an expert or specialist in your discipline.

Why choose to follow a career in your field?
Gameplay programming as a field gives you access to a varied selection of problems to solve but also keeps you closest to the aspects of a game the player will directly interact with.

This can be a source of great satisfaction when your implementation has produced a mechanic that is well received by the community. If you also happen to be interested in people and helping them develop their skills, which in turn will help lead to a better overall product, then consider aiming to be a lead. ■

If you've got job advice to share, email **acalvin@nbmedia.com**

Employee HOT SEAT

Gameplay designer James Gamlin discusses his experience working at Fuzzy Frog

What do you do at the studio?
I'm currently a gameplay designer, which entails a lot of the level design for the current project as well as working on general gameplay functionality. I perform minor scripting tasks as well, though usually to help the level development process run smoother on my end.

How did you get your current job?
I started out on the Creative Skillset trainee programme as a part of my MSc at Goldsmiths College, University of London.

This meant I was on a work placement with Fuzzy Frog, that was in turn assessed by the University. Once my placement had come to an end I was asked to remain with Fuzzy Frog in full-time employment.

What perks are available to employees at the studio?
Being relatively new to the games industry, I'm a bit unsure as to what the standard is in this situation. However what I can say is that from a graduate perspective it's been a great environment to learn about the industry and the development process outside of academia.

I've also been fortunate enough to attend the East Midlands Indies events which would not have been possible without the relevant networking connections that were available to me.

What is the recruitment process like at your studio?
We're currently in the midst of growing as a company so our recruitment consists of job postings on our website and through various connections within the industry.

> ***"From a grad perspective it's been a great place to learn about the games industry."***
>
> James Gamlin, Fuzzy Frog

We normally have quite a lot of applicants selected for interviews, and if successful will be put on a probation period for a month.

What was your own interview like?
My placement interview was with the CEO and creative producer at Fuzzy Frog; which might sound quite intimidating, but in actuality it was quite informal and relaxed.

We began with talking about the current projects and what would be expected of me if I were to join these projects. I brought my portfolio with me, which consisted of both programming and design projects I had worked on throughout my Undergraduate and Postgraduate degrees. It was quite fortunate that a lot of the work in my portfolio had connections to the current projects at Fuzzy Frog.

Describe what the atmosphere is like at your studio?
Since the company is relatively small-sized, though it has grown considerably in the past year, we all work closely with each other meaning that the different departments are all in the same room. It creates a comfortable atmosphere to be surrounded with a range of people with different skills and backgrounds.

We work very vocally, asking for advice for problems and creative feedback for our implementations, or assets. This means that everyone is given a portion of responsibility for making design decisions, which we will then review and discuss collectively at the end of each sprint. ■

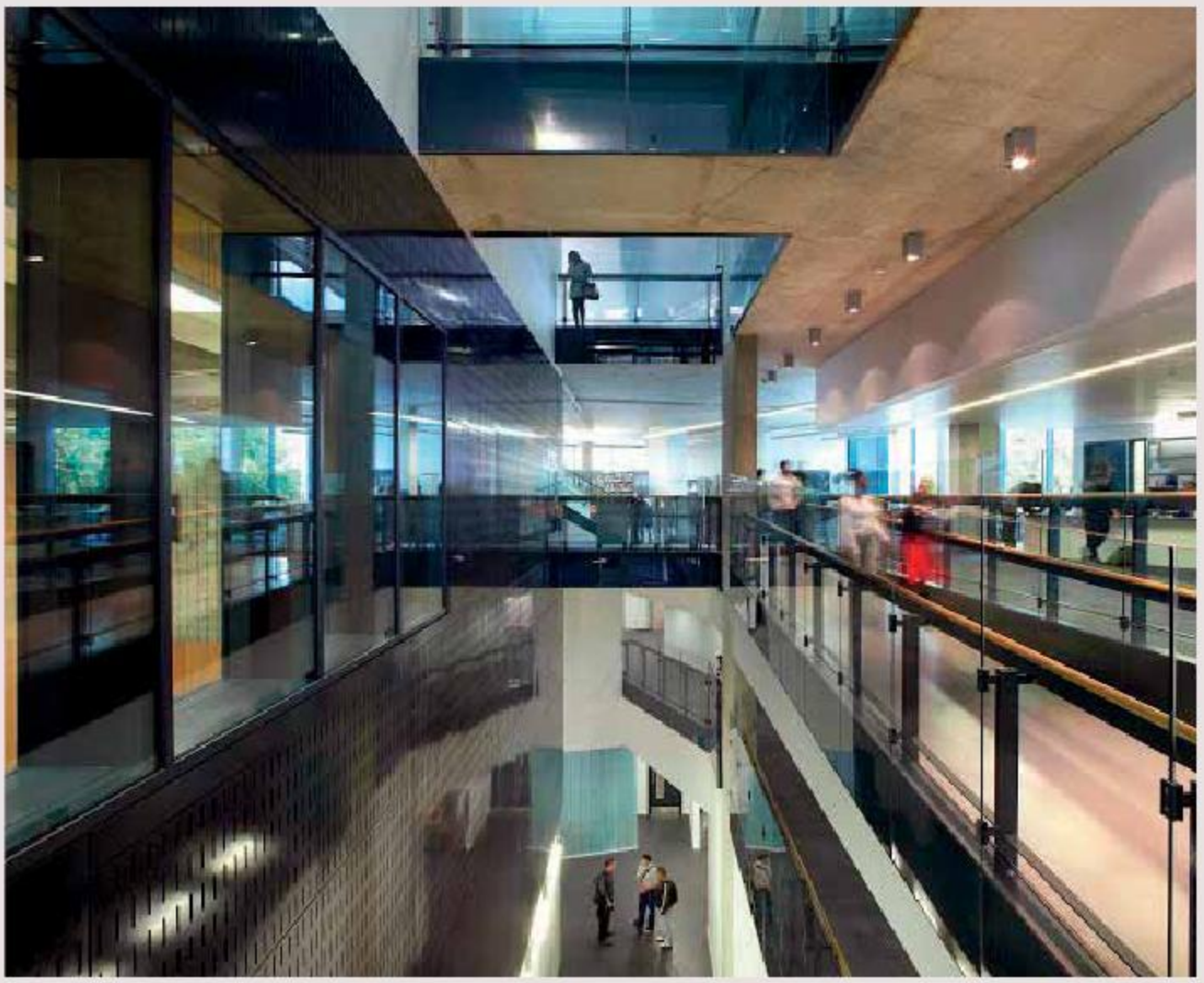
Name: James Gamlin
Title: Gameplay designer
Company: Fuzzy Frog Ltd
www.fuzzy-frog.com

SKILLS AND TRAINING

This month: Bucks New University

High Wycombe Campus
Queen Alexandra Road
High Wycombe
Buckinghamshire
HP11 2JZ

T: 0800 0565 660
E: advice@bucks.ac.uk
W: www.bucks.ac.uk



BUCKS NEW UNIVERSITY currently offers a BSc in Game Development, which includes a blend of modules that addresses all aspects of the craft, as well as insights into other disciplines including design, modelling, animation and business.

From September, the University will offer a brand new course, a BA (Hons) in Independent Game Production. Former Codemasters creative director and Sega Europe studio manager Sion Lenton has been heavily involved in the course's inception, which was also created in collaboration with the likes of SCEE, Supermassive Games and developers Simon Roth and Alistair Aitcheson.

> ***"Devs are exposed to a variety of work. They need to be confident that they can jump in."***
> Sion Lenton, NBU

The degree will cover game and level design, art, animation, programming, production and business. Lenton, associate lecturer on the programme, says the idea is to help students develop a broad range of skills and encourage a self-sufficient attitude towards development.

"This can be essential if game developers fall through the net of triple-A employment," he says. "Now is the time to embrace as many skills and learning opportunities as possible, the democratisation of professional tools and the wealth of online resources has now empowered developers.

"The concept of a T-shaped developer has been evangelised by many and with good reason. Identifying your skill set, improving it; combined with the business acumen to work as a freelance, part of a start-up or within a larger studio environment makes a lot of sense these days in this business that we call games."

Those who attend the Independent Game Production or Game Development courses will have access to the university's own dedicated labs for games, modelling and animation. The centre houses high spec hardware and commercial software tools including 3ds Max, Maya, Mudbox, Photoshop, Unity, Unreal Engine, PhyreEngine, Hansoft and Visual Studio. Students will also get access to PS Vita dev kits, Oculus headsets and mo-cap equipment.

During the second and third years pupils on the indie programme will get the opportunity to work on individual and group projects.

One example of an interesting take on game development education is the importance of formal design utilising board games, and understanding how the practical limitations resulting from creating and using physical objects can cross over into game design.

Lenton says he was interested in developing a games programme covering a broad range of subjects as, in his experience, he felt that the single-discipline model employed by some studios was potentially limiting to individuals.

"There's a lot more onus on you to solve all the problems you encounter with a high level of autonomy," he explains. "As a result developers these days are exposed to a wide variety of work. They need to be confident that they can jump in." ■

INFO

Courses: BSc Game Development, BA (Hons) Independent Game Production

Country: UK

Staff: Sion Lenton (Associate lecturer), **Guy Walker** (Course Leader)

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BUILD

THE LATEST TOOLS
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& TUTORIALS

BUILD YOUR OWN ENGINE
Indie developers tell us why they have shunned third-party offerings
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SOUND ENGINES
A look at the top audio tools powering sound effects and music
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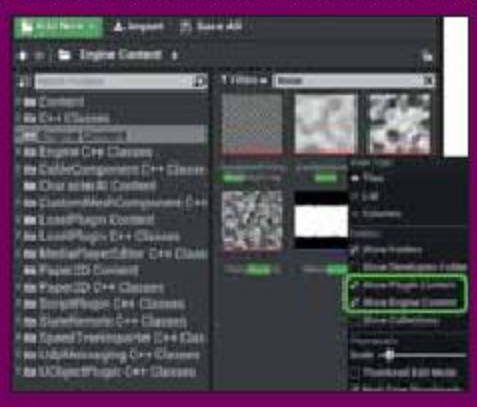

TEN UE4 TIPS
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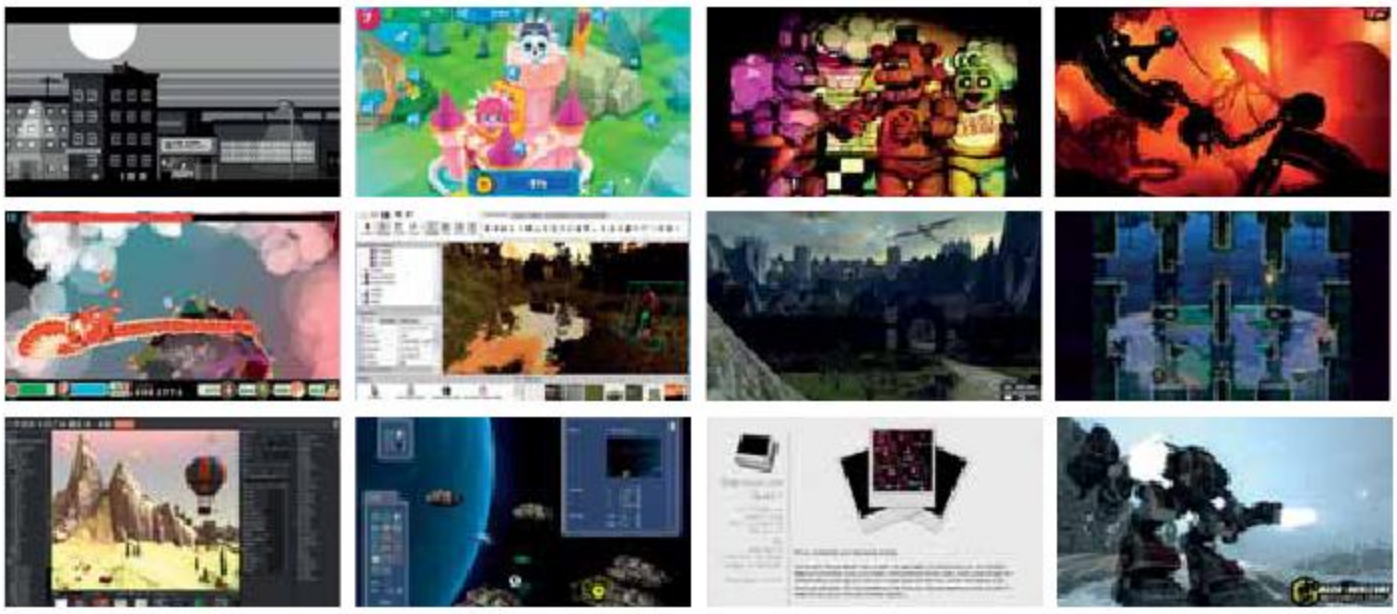


The other **engines**

Most developers have heard of the widely-used game engines such as Unity and Unreal Engine, but there are a plethora of alternatives to suit your unique needs. **Craig Chapple** profiles a series of other development tools that may be worth your time and ideally suited for the creation of your next game

SHOOT 'EM UP KIT
Company: Tall Studios
Website: www.tallstudios.com

The Shoot 'em up Kit is built by UK developer Tall Studios and is aimed at the hobbyist market. The engine has also attracted interest from educational establishments and indies looking for a quick prototyping tool, and is being used by Tall Studios itself to make titles for Steam and the Windows Store.

Features include a drag-and-drop interface to create 2D and 3D games without any scripting or programming, realistic and arcade-style physics, support for animation, customisable AI, lighting, a particle editor, video playback and also graphical and Lua scripting.

The engine is priced at a single cost of £29.95 and is available for use on PC, from Windows XP through to Windows 8. Users are then free to distribute the games they create royalty-free.

Version 2 of the game engine is set to be released publicly this month.

GAMEGURU
Company: The Game Creators
Website: www.game-guru.com

GameGuru is The Game Creators' new engine that aims to make 3D games development more accessible than ever, and is available to purchase for a one-off cost of £14.99, no royalties.

The firm already has experience with development tools such as the App Game Kit and FPS Creator, and has been developing GameGuru for more than two years. The engine is targeted at both the hobbyist and smaller commercially-minded studios, and can be used to build 3D game worlds from within the game itself – without the need for any coding.

This doesn't mean developers can't delve further into the tech however, with additional options to go deeper into the tool's features. The engine includes a terrain editor, an infinite vegetation system, AI systems and a rendering engine that supports level of detail, cascade shadow mapping, baked shadowing and ambient occlusion mapping.

COCOS2D-X

Company: Chukong Technologies
Website: www.cocos2d-x.org

The Cocos2d-x game engine is used by more than 400,000 developers and has traditionally been most popular in China, with numerous top-grossing games said to be built upon the tool, such as *Badland* (*pictured*).

The open source engine is run by Chukong Technologies and is designed to be used as both a rapid prototyping tool and for a polished, full release. It's been written completely in C++ and has been optimised for numerous devices including iOS, Android, Windows Phone, Windows and HTML5.

Features of the tool suite include a graphic renderer that supports skeletal animation, sprite sheet animation, coordinate systems, effects, multi-resolution devices, textures, transitions and more.

Other tools are also available from Chinese tech company Chukong, such as Cocos2d-js for building games in JavaScript, Code IDE for developing games with Lua and javaScript and free game development toolkit Cocos Studio.

ADVENTURE GAME STUDIO

Creator: Chris Jones
Website: www.adventuregamestudio.co.uk

It's been around for years now, but Adventure Game Studio doesn't often get the coverage or publicity it arguably deserves.

The tool is free and open source and, unsurprisingly, is ideally suited to the creation of adventure games. The AGS editor is a Windows-based IDE, and lets developers do anything from importing graphics and writing game scripts right through to game testing. Other features for the toolset include a script editor, script debugger and built-in support for translating your game text to different languages

Supported platforms for the engine include Windows, Linux and Mac. Titles such as *Resonance* (*pictured*), *Cart Life* and *Heroine's Quest: The Herald of Ragnarok* have all been developed with AGS, plus countless more from its still vibrant developer community.

As well as being useful for the development of commercial games, the tool is also suitable for the quick prototyping of games. A public repository for the engine's development is available on Github.

CLICKTEAM FUSION

Company: Clickteam
Website: www.clickteam.com

Clickteam Fusion is another engine that, like many on this list, can be used to design games with little to no programming.

Perhaps one of the most high profile games to use the development environment is popular Steam title and YouTube hit *Five Nights at Freddy's* (*pictured*), created by Scott Cawthon, though numerous other games have also taken advantage of the tool, including *Freedom Planet*.

Clickteam UK director Simon Pittock recently told *Develop* that both seasoned developers and newcomers alike will find themselves at home with its tools, which offer an extensive library of free add-on objects. The engine features a custom written native run-time for iOS, Android, HTML5, Flash and PC.

Fusion 2.5, its latest release, includes Box 2D physics, and the company has also just launched the Clickstore where developers can purchase and sell assets and extensions, much like is seen with Unity and Unreal Engine.

CONSTRUCT 2

Company: Scirra
Website: www.scirra.com

Built by UK outfit Scirra, Construct 2 has been downloaded more than two million times. The easy-to-use engine contains a drag and drop interface that allows aspiring creators with little to no development experience to make a game. It's also a useful piece of kit for experienced developers looking to prototype new ideas quickly or for those who want a faster alternative to coding.

The HTML5 game creator is designed specifically for 2D games, and includes features such as an events system that lets users create events by selecting possible conditions and actions from a list, instant preview, 70 WebGL-based pixel shader effects, a particles plug-in and more.

Construct 2 supports numerous platforms including browser, PC, Mac, Linux, Windows 8 and Windows Phone 8.

The engine comes in two licences, Personal, which costs £79.99, and Business, which is available for £259.99. A free edition is also available to try.

CHILLISOURCE

Company: ChilliWorks
Website: www.chilli-works.com

ChilliSource is a new free, open source engine from Scottish studio Tag Games, which we covered extensively in the previous issue of *Develop*.

The tool, which comes under the wider development package ChilliWorks, was initially created to power its in-house projects, but the firm is now sharing it with other developers, as well as a raft of metrics tools and a collection of back-end services, including for IAPs and leaderboards.

The game engine features 2D and 3D support, networking, shader support, a GUI for different resolutions, C++ 11, modular and extensible lighting and shadows, skinned animation and more.

ChilliWorks has been used in titles such as Mind Candy's *Moshi Monsters Village*, Ubisoft's *Might and Magic: Clash of Heroes* and Tag Games' own *Funpark Friends* (*pictured*).

Tag is currently calling for developers to help it work on the project.

TWINE

Creator: Chris Klimas
Website: www.twinery.org

Its name is known by many throughout games development, but few have actually dabbled with Twine, a tool used for creating interactive fiction.

This genre of gaming has been making a comeback in recent times and now comes under its own interactive fiction section on Steam, and Twine is one of the top tools for making these types of titles, while it also works well as a useful and quick prototyping tool.

Another open source tool that is free for commercial use, Twine does not require users to write any code to create a story, though projects can be extended with variables, conditional logic, images, CSS and JavaScript.

The tool publishes directly to HTML, meaning creators can post there work in numerous places.

Twine 2 was released last year, making it browser-based and also offering Linux support in what was regarded as a significant update for the tool.

PLAYCANVAS

Company: PlayCanvas
Website: www.playcanvas.com

Founded in 2011 and built by a London firm of the same name, PlayCanvas sets itself apart from many other engines by enabling developers to build their games completely in the cloud.

The Develop Award-nominated HTML5 engine houses numerous features and tools to build 3D games for browser and mobile devices, such as real-time editing that allows collaboration with remote team members at the same time.

The tool comes in a number of different packages including a free option for commercial games with storage space of up to 200MB. For this however, projects will be in the public eye and is for teams up to two.

Other indie licensing packages use subscription models from $15 to $60 a month depending on the size of the team, number of projects and storage space required.

Further for organisations making more than $100k a year are also available up to $400 a month, as are expanded support packages.

MONOGAME

Company: MonoGame company
Website: www.monogame.net

MonoGame is a free open source implementation of the Microsoft XNA 4 Framework and has gathered a large community since Microsoft's own abandonment of the XNA development framework.

Last month, the developers behind the tool reached a major milestone following the release of update 3.3 – the XNA framework is no longer required to use MonoGame. This means MonoGame developers can now fully develop their games on Windows 7, 8, 8.1, MacOS (using MonoDevelop) and Linux.

MonoGame has been used to develop games over 100 games, such as Matt Makes Games' *Towerfall: Ascension*, Tribute Games' *Mercenary Kings* and Supergiant Games' *Transistor*.

The tool can be used for both 2D and 3D games, and leverages C# and other .NET languages. The recently released update also added a number of enhancements and functions, and all the tools and content pipeline are now built for 64-bit.

TORQUE 2D AND 3D

Company: Garage Games
Website: www.garagegames.com

Both Garage Games' Torque 2D and Torque 3D tools have been made available as open source software and used by a wide variety of developers.

Torque 2D supports platforms including Mac, PC and iOS, and includes the complete C++ source code to the engine, as well as scripting language TorqueScript, which allows developers to write gameplay logic on Windows or OS X and have it work on other platforms. Also included are the usual rendering tools, the Box2D physics system and the OpenAL sound library.

Torque 3D meanwhile features a suite of tools including shape, terrain, decal and particle editors, lighting tools, Nvidia PhsyX integration for destructible objects and cloth and rigid body dynamics. The toolset also houses a renderer that includes shader features such as per-pixel dynamic lighting, normal and parallax occlusion mapping, screen space ambient occlusion and more.

COPPERCUBE 5

Company: Ambiera
Website: www.ambiera.com/coppercube

Last year Ambiera released the fifth version of its game engine and editor CopperCube.

The development platform can be used to create 3D games, apps and even websites, without the need for programming, though a scripting API is available for advanced users.

Latest additions and improvements to the engine include terrain support with its own terrain editor, a physics engine for the native targets, video playback in 2D and 3D, network communication, iOS 8 WebGL support, shader programming, animation blending, directional light and more.

Basic and Professional versions of the engine are available for purchase. The Basic edition, which costs £76.98, includes many of the tool's features but does not contain video playback or Oculus Rift support, and developers have 10 maximum amount of scenes per document. The Professional edition is available for £295.47.

MORE GAME ENGINES

There is a plethora of game engines and development frameworks out there for all different kinds of developers. We've added a selection of more tools for you to check out should you still be looking for something to fit your needs

App Game Kit
www.appgamekit.com

BigWorld
www.bigworldtech.com

Corona SDK
www.coronalabs.com

GameMaker
www.yoyogames.com

GameSalad
www.gamesalad.com

Havok Vision Engine
www.havok.com

HeroEngine
www.heroengine.com

Leadwerks
www.leadwerks.com

LibGDX
libgdx.badlogicgames.com

Loom SDK
www.loomsdk.com

Love
www.love2d.org

Marmalade
www.madewithmarmalade.com

Project Anarchy
www.projectanarchy.com

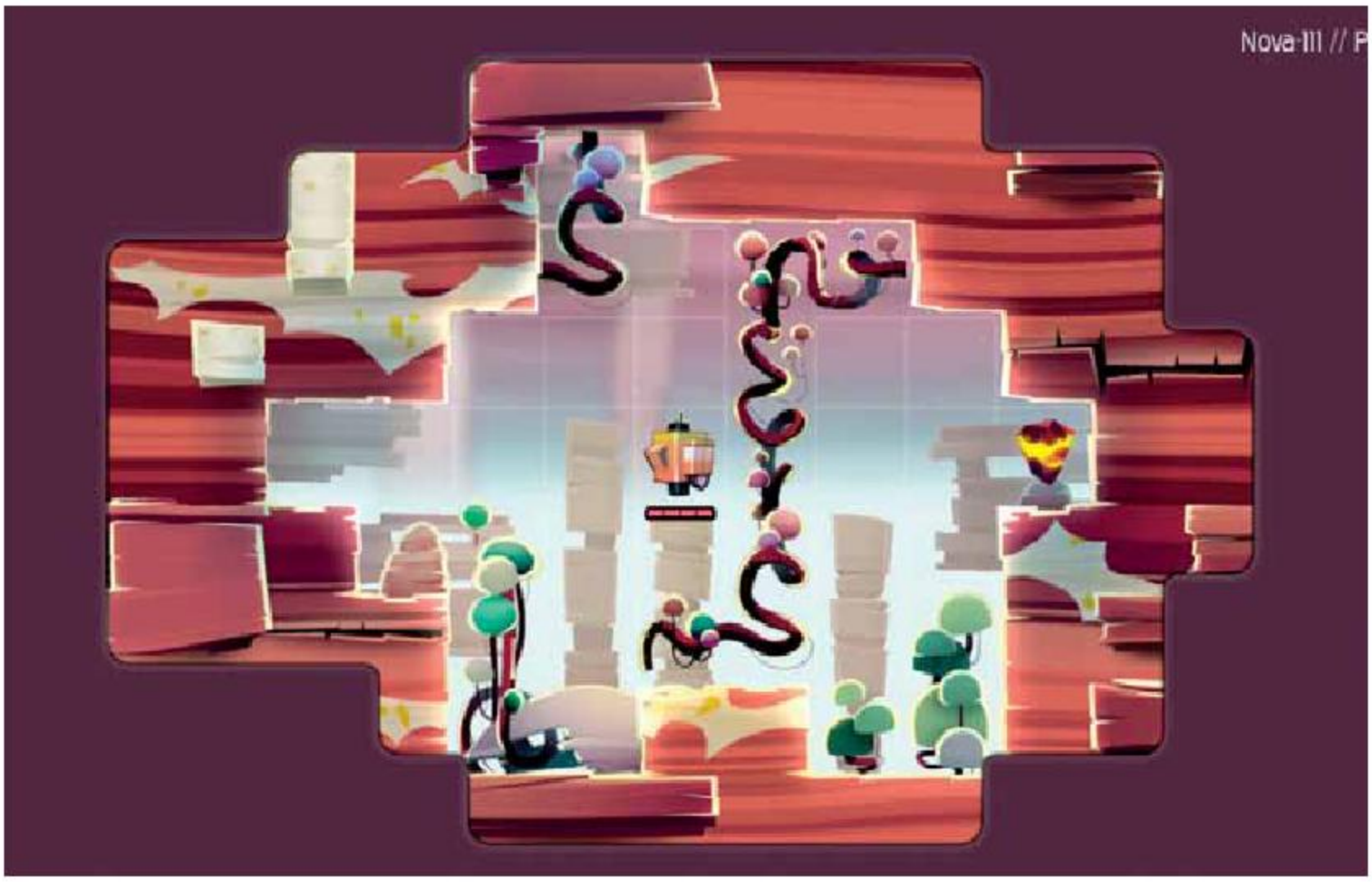
ShiVa
www.shivaengine.com

Solpeo Game Engine
www.solpeo.com

Source 2
Coming soon

Turbulenz
biz.turbulenz.com

V-Play
www.v-play.net



Engines to **DIY** for

For some small studios, making a game isn't enough; a plucky band also choose to build their own engines. **Will Freeman** asks those developers doing just that why the extra work can be worth the effort

Top to bottom: OutOfTheBit's Ali Motisi, Funktronic's Eddie Lee, and Kevin Geisler of Young Horses

ACROSS THE GAMES development process, often taking the best decision means going the more testing route.

Many smaller studios, however, might balk at the idea of building their own complete game engine, especially when the major providers remain locked in a battle over accessibility and affordability.

Nevertheless, a band of plucky indies and microstudios is doing just that, constructing their own game engines. Some do so by stitiching together existing free, open-source tools and middleware with smart programming. Others even construct the entire game engine from scratch.

One such team is The Quadsphere, the studio behind action titles such as shmup *Icarus-X* and racer *FMX Riders*. Nicholas Sevez is the outfit's founder and developer, and strangely enough, he speaks highly of the current state of provided game engines.

"Modern engines have lowered the barriers to entry in development to unprecedented levels," suggests Sevez. "They are incredibly complete feature-wise, and layman-friendly, notably with visual scripting. Nowadays it's not unreasonable to ship a finished product with no low-level programmers involved."

He continues: "While this is certainly appealing to non-programming devs, I can't help but feel my core skills are underused, and this kills the fun of development and makes the whole endeavour less rewarding."

It's a sentiment echoed at numerous teams building their own game engines. Programmers, for better or for worse, are commonly devotees to their craft, and if ever there was a place to apply that craft, it is building new tools and ultimately a game engine. Sevez and many of his contemporaries remember a time when such programmers led innovation, establishing technology as they made games; names like Tim Sweeney and John Carmark, who stood as revolutionaries in the GPU uprising.

> ***"The advantage we have using our own engine is we have complete control of its implementation."***
>
> Eddie Lee, Funktronic Labs

But what about the other, more pragmatic reasons for a small team to shun convention and build their own game engine?

CRAZY HORSES?

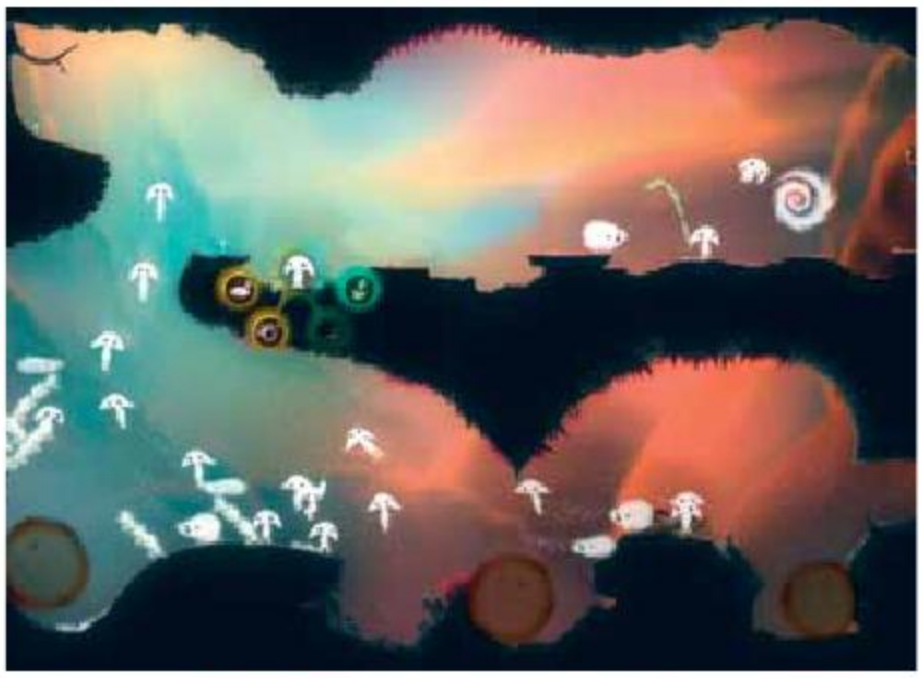
For some, it can be a simple matter of cost. Before Young Horses made its name with *Octodad*, the team were students with an idea about a paternal cephalopod. The likes of Unity and Unreal Engine were, in 2010, out of their price range, so they conceived a way to reduce the engine cost absolutely.

"We chose to use an open source rendering engine called Irrlicht and also integrated PhysX for physics and FMOD for audio," explains Kevin Geisler, programmer and producer at Young Horses. "This allowed us to minimise our upfront costs to $0. We also used WinForms and other assorted open-source C# projects to build a scene editor on top of our [game] engine."

For others, creative distinction is an equally motivating factor. When Spaces of Play began their unusual naturalist adventure *Future Unfolding*, they set their sights on capturing the look of Impressionist paintings, and they were convinced commercially available complete game engines wouldn't do their game justice.

"Rather than to shoehorn our art style into an existing engine and risk compromising it, it made much more sense for us to build exactly the tech we need to match the vision we had for *Future Unfolding*," offers Spaces of Play's business and development team member Andreas Zecher.

The team went to work writing an internal framework in C/C++ using SDL2 and OpenGL. Spaces of Play has added a dash of FMOD, and adopted the open-source FreeType 2 text rendering library, and for now, they aren't looking back. Zecher is



Top to bottom: The Quadrosphere's Nicolas Sevez and Firedance Games' Sean Lindskog

confident their game engine offers powerful, efficient porting; a feature normally deemed a reason to pick a full solution off the shelf.

ENGINEERING AN ENGINE

Sean Lindskog was motivated to build an engine from free, largely open-source middleware for many of the reasons above. The Firedance Games lead developer wanted something to offer him an affordable canvas for distinct creations, both for his space opera *Salvation Prophecy*, and an unannounced title. But that wasn't the only reason Firedance decided against a full commercial game engine.

"At a more fundamental level, I wanted to fully understand the technology I was using," says Lindskog. "Building the engine yourself will teach you this.

He adds: "There's a massive educational value. Also, you aren't trapped in the 'sandbox' of how another company's engine is designed to work."

Another developer that also embraced making a custom engine, in part because of the benefits of the experience of creating it, is Eddie Lee. He is founder at Funktronic Labs, which built an engine from scratch for various projects, including the in-development sci-fi turn-based adventure *Nova-111*.

"The biggest advantage we have with using our own engine is that we have complete control of its implementation," states Lee. "Rather than being constrained within the limitations of any existing middleware or engine, we are pretty much free to implement what we want and experiment however we want. Oftentimes, established engines are very refined but it comes at a cost of being limited to its feature-set"

There are ample reasons to opt for making your own full game engine then, whether from scratch or using a collection of specialist tools. But how to broadly approach the undertaking?

"C++ and OpenGL are the obvious tools for the task," recommends The Quadsphere's Sevez. "Although Microsoft requires you to use DirectX if you want to target Xbox, C/C++ and OpenGL are typically available on all modern gaming platforms."

He later adds: "While the whole of the task is daunting, starting with a minimalist implementation – exporting and displaying meshes – and progressively adding features – lights, skinned meshes, scripting, etcetera – worked well for me."

For Firedance Game's Lindskog, meanwhile, it's a matter of starting with your game.

"First, you need to flesh out the basic design of your game," he suggests. "Then you look at what tech you'll need to build it."

> ***"Creating a custom engine is a gigantic steaming crap ton of work. You need the skills and more time."***
>
> Sean Lindskog, Firedance Games

Lindskog is also a proponent of using existing open-source tools.

"Some game tech is pretty standardised – unless you're doing something weird. Stuff like audio and physics. So I wouldn't waste my time re-writing that."

"I look for open source middleware first. Having open source code empowers you to change features, find problems and fix bugs yourself. If nothing's available, I'll consider closed source. And finally, I write any tech myself which involves unique gameplay, or if no other good solutions are available."

Sometimes, of course, accepting a full external game engine is the right choice for your project if it's is better for the game, the studio and the staff. Ali Motisi is director of OutOfTheBit, a prolific app developer that with a team of just six has made numerous games using its own AppPipe C++ custom engine, motivated by the idea of remaining independent from underlying platform technology. The team also crafted a vector graphics engine of their own they named Stork, which OutOfTheBit used in its iOS game *Anima*.

WHEN MIDDLEWARE MATTERS

The studio continues to focus on its own technology, but that doesn't mean Motisi would recommend the approach for everyone.

"It really depends on the game you are trying to make," he says, on the matter of choosing to construct your own game engine. "If you are trying to build a cross-platform game with pretty standard 3D visuals, then Unity or other pre-made engines could give you a leg up. If, on the other end, you'd like to experiment with a custom graphic style or specific audio techniques then you may find yourself fighting against the engine."

Motisi also admits that while building AppPipe was easier than they had imagined, it remains remarkably hard work.

It's a sentiment shared by Firedance's Lindskog, who spells it out utterly simply.

"Creating a custom engine is a gigantic steaming crap ton of work," he concludes. "You need to have the right skills, and a lot more time."

Custom game engines, then, are not for everyone, but for the right team, working on a distinct game, constructing a custom engine is far from impossible. It's a chance to hone skills and an opportunity for programmers to prove their salts. Whether spun from assorted technology or built entirely in-house, custom game engines offer an opportunity to maintain ultimate control.

They may leave you without support, without a user community and without anybody else to blame, but for many, custom engines remain the only way to go. ■

Pic credit: Matt Holloway

Geared for sound

We speak to audio specialists about why developers should consider investing in a quality sound engine

Above: Audiokinetic's Mike Drummelsmith says dedicated sound engines can offer features that the leading game engines have yet to implement

MANY ENGINES TODAY handle almost every aspect of development, giving games-makers a one-stop shop for their projects. However, some elements can benefit from a more specialised focus, with audio being a prime example.

Companies such as Audiokinetic and Firelight Technologies have built their businesses on offering devs comprehensive sound engines, which offer more in-depth features for audio engineers.

"Audio is often an afterthought for full game engines, since it's a much tougher feature to highlight in a sizzle reel," says Audiokinetic's director of developer relations Mike Drummelsmith. "They'll offer means to add features that are missing, but then they have to develop and maintain features that might already exist in the dedicated sound engines.

"Sound engines will have had years or decades more development put into them, and will still have a huge advantage in terms of features, usability and stability."

SOUNDS GOOD

The advantages of products such as Wwise and FMOD are numerous, but FMOD Studio product lead Raymond Biggs says it comes down to one important factor.

"It frees you to focus on the most interesting part: the content," he says. "Even if you have specific requirements, using a mature audio API lets you focus on the what's going to set your game apart, without needing to reinvent the wheel.

"The other great thing about using these engines is they allow you to iterate quickly. You can start with a rough sketch of the audio in your game, using placeholder assets, and continually refine. By offloading the implementation to an audio engine, the content is free to evolve without touching any code."

Of course, ambitious studios can attempt to develop their own sound engine if they have specific features and audio effects in mind, but Drummelsmith warns that it can be more efficient to avoid doing so.

"When compared to writing your own sound engine, a dedicated product will always have more features from the start," he says. "It will also be more tested and stable and have stronger integration tools.

> ***"By offloading to an audio engine, the content is free to evolve without touching any code."***
>
> Raymond Biggs, Firelight

"More importantly, potential hires to your team are infinitely more likely to already be trained on the dedicated sound engine versus the in-house solution."

Biggs adds that there is an even more pressing concern: cost.

"For games of any budget – and especially those under $100,000 – the benefits of using an audio engine far outweighs the cost of developing your own solution," he says.

Drummelsmith agrees: "Even taking licensing costs of the sound engines into account, the overall cost is often much less expensive when compared to staffing up, training internally, and developing and maintaining an in-house solution over the years and on new platforms."

UPDATED TOOLS

If you prefer to stick to the audio features of established game engines, both Firelight and Audiokinetic assure users that they endeavour to keep their products in line with leading tools such as Unreal and Unity.

"As with any external technology, or tool outside of your game engine, you have to be aware that sometimes versions may lag behind a little bit, or planned features might take time to develop and release," explains Drummelsmith.

"When a new release of the core game engine comes out, it's possible that you might have to wait a couple of weeks for the new integration with the sound engine. This is normal, but often teams will get excited about new core features, and then realise after the fact that they should have waited for all of their tools to catch up."

Both firms are also keen to stress that they are open and responsive when it comes to future versions of their own tools.

Drummelsmith concludes: "The teams behind sound engines are generally always open to working with developers to scope new features and implement them.

"When you're working with any other third-party tool, it really pays to engage with them: ask questions, request features. Most importantly, don't hide things unless you have to. If you approach a software maker with a feature request but then don't explain what your goal is, the odds increase that what gets developed isn't exactly what you were looking for." ■

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UNREAL DIARIES

Open worlds and Hollywood animation

Epic shows how Unreal brings these elements into games by delving into the Kite real-time demo

Main: The Kite demo, first shown at GDC, shows how Unreal Engine 4 handles large environments in real-time

AT GDC 2015, Epic Games affirmed that the future of interactive 3D demands realistic rendering powered by a physically-based rendering (PBR) pipeline.

Demonstrating this notion were two key Unreal Engine 4 projects: *Thief in the Shadows*, a VR collaboration with Weta Digital based on *The Hobbit* films, and Epic's own *Kite* real-time open-world demo.

The former is a cinematic experience in which the viewer faces off with the infamous dragon Smaug. The GDC-exclusive demo was optimised for Nvidia GTX Titan X and was shown using the Oculus Crescent Bay headset.

The latter experience was on the other end of the spectrum from a creative and emotional standpoint. In the cinematic used to show off the demo, which also runs on the Titan X, a boy pursues his stray kite, chasing it over hills and through streams, as a touching score augments the peaks and valleys of his journey.

Tim Sweeney introduced the *Kite* demo in his session: "Every year, Epic's engine developers get together with Nvidia engineers, and we have a summit to figure out what is just on the verge of becoming possible with the combination of GPUs and software. These efforts have led to past Epic tech demos, such as *Elemental* and *Infiltrator*. We're in a new world now. This year, we assembled a team and asked them, 'What does Unreal Engine mean to you today?'"

The *Kite* demo, taking place across more than 250 square kilometres of terrain, is their answer.

"Everything in the *Kite* demo is running in real-time in Unreal Engine 4 at 30fps," said Kim Libreri, CTO of Epic Games. "In addition to our new open-world features, you're seeing fully dynamic direct and indirect illumination, cinematic quality depth of field and motion blur, PBR photo-modelled assets and procedural asset placement."

The boy's face has more than 500 sculpted blendshapes, all blended in real-time. This level of fidelity, combined with new techniques and photometric sampling of real world data, is all part of Unreal Engine 4's pipeline. Epic plans to release the assets in the Marketplace with the launch of Unreal Engine 4.8.

As Sweeney noted, what the creators saw when they built the *Kite* demo is a microcosm of what Epic sees for the game industry: Now is the revolution, a time to try new things and experiment with new technology.

Epic is leaning into its philosophy that with Unreal Engine 4 developers get everything so they can build anything, and in that lies the power to stand apart. ■

> ***"Every year, Epic gets together with Nvidia to figure out what is on the verge of becoming possible with GPUs and software."***
>
> Tim Sweeney, Epic

UPCOMING EPIC ATTENDED EVENTS

Epic Attended Events
Nordic Game
May 20th to 22nd
Malmö, Sweden

Electronic Entertainment Expo
June 16th to 18th
Los Angeles, California

Develop: Brighton
July 14th to 16th
Brighton, England

*Email **licensing@epicgames.com** for appointments and sign up for Epic's newsletter at unrealengine.com.*

Epic is hiring. To find out more visit: **epicgames.com/careers**

FOR MORE SUCCESS STORIES, VISIT: UNREALENGINE.COM/SHOWCASE

DEVELOP'S TOP TIPS:

10 THINGS YOU DIDN'T KNOW YOU CAN DO WITH UE4

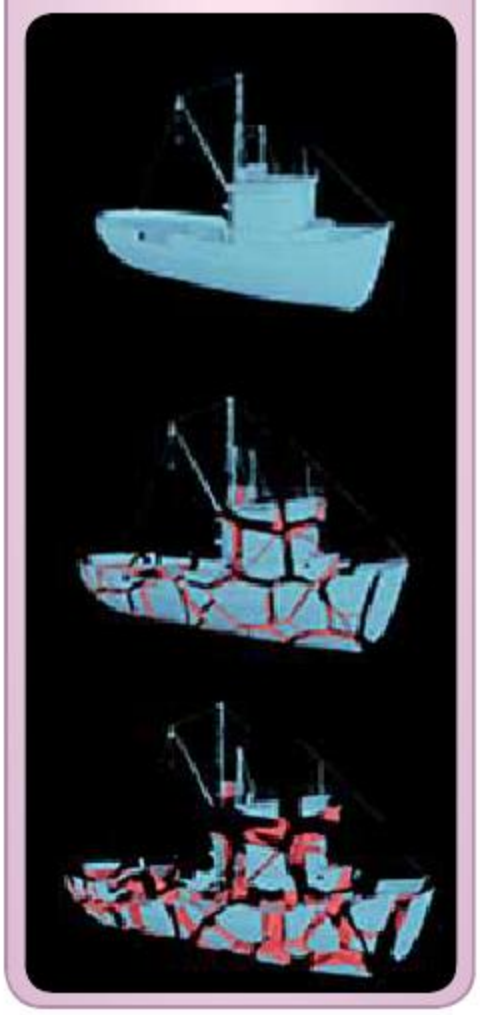
Members of the Unreal Engine community share some of the technology's most helpful features

1. In Unreal Engine 4, you may notice many asset thumbnails are colour coded: animations being green, skeletal meshes being pink, maps being orange, and so on. You can take this a step further by colouring your folders in the Content Browser. For example, right-click on your 'Blueprints' folder, select 'set colour' and set it to blue.

Gavin Milroy, Unreal Engine Community

2. You can create a destructible mesh form any static mesh in just a few clicks. Convert any static mesh into a destructible mesh within the editor, modify the fracture settings and fracture the mesh quickly and easily. You can then apply a different material to the fractured pieces and add a particle explosion effect with sound that will occur when the mesh destructs.

Cam Mason, Unreal Engine Community



3. When you're testing your network replication, it can be useful to work locally without the need for a bunch of extra computers.

The Play In Editor (PIE) function offers the ability to pick the number of game instances to start and optionally even run a dedicated server precisely for this reason.

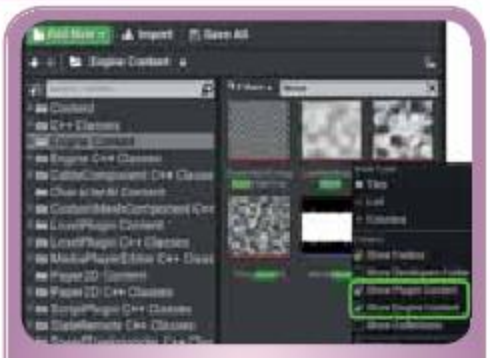
Kyle Rocha, Unreal Engine Community

4. Unreal Engine 4 does 2D. You can create static and animated sprites inside the Content Browser, and use the Paper2D Sprite Editor to set up and edit individual sprite assets. Use Flipbook Editor to craft Flipbook assets, edit sprite play sequences, tune sprite display duration, and determine animation speed through the Frames Per Second option. There's a "Getting Started with Paper2D" thread on **forums.unrealengine.com**.

Dana Cowley, Epic Games

5. When you have a lot of interaction between multiple Blueprinted objects, it can be difficult to visualise the flow from Blueprint to Blueprint. Click on Windows, then Developer Tools, then Blueprint Debugger, which lets you interactively view the full call stack for of all Blueprint execution.

Kyle Rocha, Unreal Engine Community



6. The engine and numerous plug-ins include content such as models, textures, icons and materials which can be useful for debugging or just getting up and running on something fast. By default, this content is hidden but it can be shown in the Content Browser's View options.

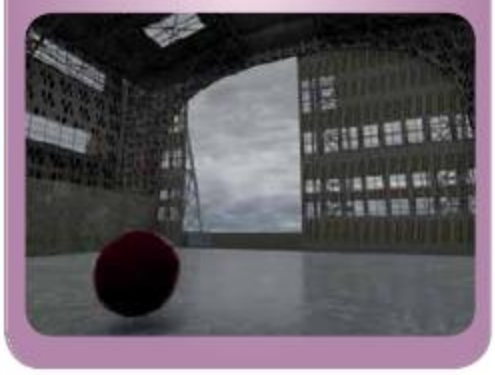
Kyle Rocha, Unreal Engine Community

7. You can copy-paste node networks, like Blueprints and materials, and share them using text files or Pastebin. Just select the nodes from the graph and press Ctrl-C to copy. Then open your favorite text editor or head to Pastebin and Ctrl-V to paste.

Tom Shannon, Unreal Engine Community

8. You can achieve a uniform lighting condition of overcast weather using only a movable skylight and an atmospheric fog object. By doing this, there is no need to build any lighting or use any other light source for the effect. Thanks to distance field ambient occlusion, this works beautifully, even in semi-closed interiors.

Mehmet Güven, Unreal Engine Community



9. When building up many assets in your Content Browser, it is easy to get lost or frustrated by having to go within subfolders of folders. If you find yourself going back and forth with this, take a look at Collections. These let you store your most commonly used assets and really help with your workflow. To create a Collection, look towards your Content Browser, underneath your content folders you should see a little '+' icon. Click this, create a new local collection, and drag and drop the assets you are currently working on into here. Note: If using 4.7, make sure the show collections option is checked in the View options of your Content Browser.

Gavin Milroy, Unreal Engine Community

10. You can now search and rate Marketplace content over the web. Check out **unrealengine.com/marketplace**.

Jon Jones, Epic Games

MADE WITH MARMALADE

A Quick update

With a refresh of the 2D game creation tool on the way, we take a look at what users can expect from Marmalade Quick

Above: Marmalade's Nick Smith says Quick has been revamped to provide easier access to advanced features such as pixel shaders

Main, left to right: Snazzlebot's Coins and Stuff and Dream Candy Planet; Fluff Stuff's Polyganic; and Marmalade Game Studio's Signal to the Stars are just some of the games built with Marmalade Quick

MARMALADE QUICK, A Lua-based RAD tool used to build 2D games, is due a number of significant updates over the next few weeks.

Perhaps the biggest is an overhaul of the software's sprite-rendering features, providing more than 100 out-of-the-box effects that devs can use, as well as the addition of multi-pass filters: shader-based effects that can be applied to any sprites by setting simple parameters in your Lua code.

Also in the mix are new node types; the ability to render and apply textures, fills and gradients to any objects; and the opportunity for users to create their own shaders with Cocos2d-x. In fact, the firm says that shaders are central to the new and improved Marmalade Quick.

"Previously, using effects in a Marmalade Quick game typically meant frame-based animation or tweening colour, position, size and so on," says Marmalade Technologies' senior engineer Nick Smith. "Pixel shaders let you add much richer algorithm-based effects and avoid CPU overhead if you were previously generating lots of scene nodes to accomplish a similar effect.

"Since Quick's engine is open source and based on Cocos2d-x, you could already use pixel shaders if you dug into the C++ code and added them yourself, but most users were unlikely to do that. We've added direct access to OpenGL ES shader APIs from Quick, and easy-to-use Lua interfaces that will let you just pick effects and set parameters for things such as blur, bloom, bulge and cartoonise."

These new interfaces are not just to make things simpler for established Quick users, but also more accessible to newcomers. To that end, Marmalade is also integrating both the Lua IDE and Quick's debug and optimisation options with the Hub, the firm's go-to tool for managing apps throughout their lifecycle.

> ***"Users will be able to just pick effects and set parameters for things such as blur, bloom, and bulge."***
>
> Nick Smith, Marmalade

"This update will add a whole bunch of great, easy-to-use effects, but also improves performance, project management and optimisation options," adds Smith.

"We're making some small changes to project structures to make it easier to update versions, add your own integrations and optimise builds."

The decision to build Marmalade Quick on Lua code was crucial given the diversity of platforms its users deploy their games to. Smith observes that Lua can be found in one form or another in hugely popular games that range from *Angry Birds* on iOS to *World of Warcraft* on PC.

"Although engines typically use native code, you'll find top games on the app stores from the likes of EA and Gameloft will have a Lua run-time embedded in them for scripting," he says.

"As a scripting language, Lua is flexible and easy for non-programmers to work with when needed, but it is also lightweight and binds to C++ code for optimum performance. As well as Quick, Marmalade also provides a vanilla Lua run-time to use in your own C++ games."

The new features will be added to Marmalade Quick over the coming weeks. Looking further ahead, the firm also has plans to add a new UI library, easier access to third-party features such as iAd, Amazon Ads and Google Play Game Services, and additional improvements to both performance and project workflow. ■

You can find out more about Marmalade Quick by visiting **www.madewithmarmalade.com/products/quick**.

Why Marmalade matters

Marmalade Quick enables devs to rapidly create 2D games for all platforms supported by the Marmalade SDK.

www.madewithmarmalade.com

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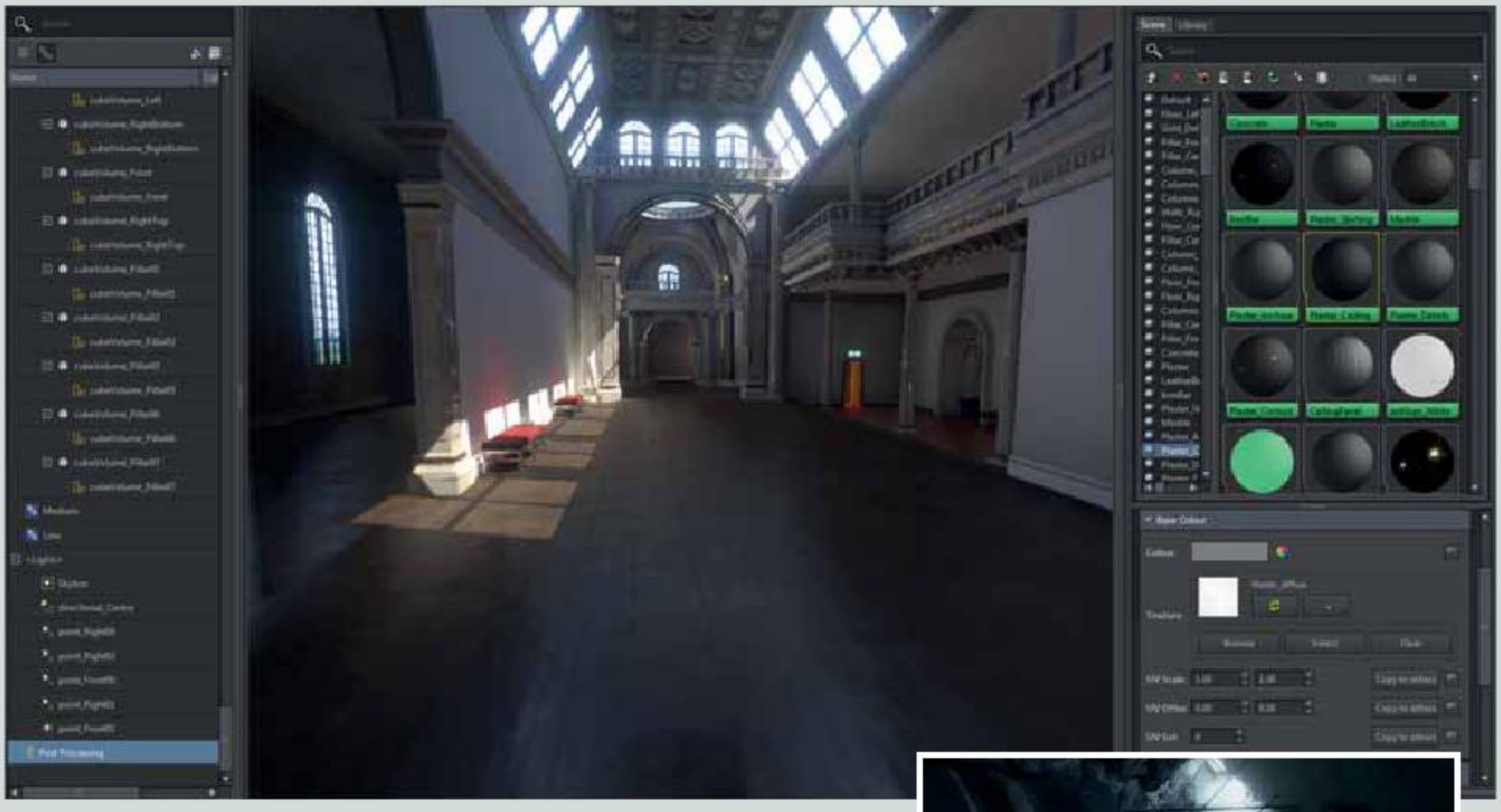

KEY RELEASE

Forging ahead

Enlighten 3 has been released, and with it comes a new lighting editor Forge. **Craig Chapple** asks Geomerics director Chris Doran what it hopes to achieve with the latest update and the newest tool in its arsenal

Geomerics director Chris Doran (above) says Forge makes it easier for artists to see how their work will benefit from Enlighten's lighting effects, as shown by the firm's Subway demo (main)

HAVING POSITIONED ITSELF as one of the go-to lighting tools for games developers, Geomerics has just released Enlighten 3.

New features to the tech include more accurate indirect lighting, colour separated directional output, improved light map baking and richer material properties, all shown off in the startling Subway demo.

One of the key features of the latest update is the integration of a newly built lighting editor named Forge. The tool has full support for physically-based shading, and lets artists create real-time lighting for their games and quickly iterate on a scene.

Thanks to import functionality with Autodesk's 3ds Max and Maya, as well as its modular design, the tool offers a customisable foundation to integrate Enlighten into the development pipeline.

FORGING LIGHT

Speaking to *Develop* at GDC, Geomerics director and founder Chris Doran said the tool was designed to get the tech into the hands of artists as soon as possible.

"Sometimes we encourage them to evaluate Enlighten through Unreal Engine, because it's easy to get hold of, but that can be awkward if they're trying to test stuff out with their own project," he says.

"We've also developed pure plug-ins for Max and Maya, which have been okay, but we decided we really wanted more control over the renderer ourselves. We didn't want to be constrained by the Max and Maya viewports, we wanted our own tool that had a thin pipe between the DCC tool and was more representative of the type of tools that you would build into your own game pipeline.

"Forge serves two purposes, it gives artists immediate feedback on what their assets look like, but it can also go straight into your tools pipeline. So you can have a workflow where the assets are created in Max and Maya, they go through Forge and then they go into your engine."

It's that ease of integration into existing games development pipelines that Doran hopes will make the tool a more enticing prospect for developers, as he admits while some integrations have been quick and easy, some have been more difficult.

He goes on to say that Forge is more typically aimed at indie and mid-tier devs.

"We looked at what Unity has done with Enlighten and they've made it a lot simpler and easier to use, and we've taken inspiration from that," says Doran.

"So Forge is certainly aimed more at the mid-tier and indie firms. A lot of the high-end guys are using Enlighten already, and most of them aren't going to use it until they've seen it in their own engine.

"But for the mid-tier guys, or the guys who don't have a polished pipeline, Forge makes a lot more sense."

LIGHTING UP

Another addition to the tech is Silicon Studio's post-processing effects tool Yebis 3. This adds features such as depth of field, motion blur, customisable glare effects and bokeh to the tool and a scene.

Doran said the partnership came about after Geomerics was looking to add post-processing to Forge, and weighed up whether to build the tech itself or licence some in. He says it was important to have, as this isn't the sort of thing that every developer has in their pipeline, so the team wanted to make sure artists had these tools available to them in Forge.

"As we've always sung the advantages of middleware, we thought well, we should obviously licence it in, it's the whole point," says Doran. "So we looked around and Yebis is clearly leading there. It made a lot of sense. They were strong in a market we're not so strong."

He adds: "It solved a big problem for us. We got it all up-and-running pretty quickly. We only really started work on this in January. I think it's the start of, hopefully, a longer-term relationship." ■

www.geomerics.com/enlighten

HEARD ABOUT

The music of Evolve

John Broomhall talks to composer Jason Graves about scoring Turtle Rock's multiplayer shooter

Tell us about Evolve.
Evolve is a co-op first-person shooter that pits four hunters against a monster – and you can play either side. The hunters are specialised in certain areas and the monster has different strengths, along with the ability to eat local wildlife and evolve into a bigger, more powerful foe.

Turtle Rock wanted something different and gave me free reign to experiment. The resulting score is incredibly reactionary and very sound design-oriented, almost to the point where it functions more as sound design and UI effects than traditional music. Actually it's two scores: you get a completely different musical experience depending on which side you take.

How did you create an original sound?
One of the many benefits of technology is the sheer number of sounds we have at our fingertips. However, that means every composer potentially utilises a lot of the exact same sounds. As with everything I do, I wanted to focus on originality as much as possible, beginning at source.

Most of the score was generated from scratch with either hardware synthesisers or custom recordings of my growing collection of things to pluck, strum, bow and generally abuse – including my 1920s piano soundboard under the studio stairs, which got a lot of attention. There were plenty of strums and swipes on the piano strings, which were used a lot for the monster music.

I was surprised how much tapping and rhythmic scraping with razor blades and large nails made it into the score. It's in almost every cue and unintentionally became the backbone of the music, a major contribution to the overall sound. I also did a lot of 'found sound' recording, especially for the monster cues, including sheets of foil wrapped around the strings of my contrabass. Even a spare birdcage was put to good use.

Another major contribution came in the form of my constantly growing guitar setup. I literally ran something from every cue through them. I had no shortage of original sounds to choose from once they made their way through the 20-plus guitar pedals.

Hopefully the result of all these musical experiments is something that feels futuristic and organic at the same time. I'd describe it as groove-based ambient music with experimental effects.

How is music delivered interactively? How is it structured and delivered?
Stingers, lots of stingers. Anything from short, five-second notifications to 30-second pieces that slowly fade out. For example, in 'Nest Mode', there's a longer, groove-based bed that plays in the background while shorter, more harmonic stingers are triggered by the gameplay on a fairly frequent basis.

There are four hunters, so something is happening pretty much every five seconds or so. I made six variations for most of the stinger classes. Each objective has at least four or five classes plus variations of intro, outro, win and lose stingers, so the number of files adds up quickly.

What are your thoughts on music for multiplayer generally?
In my experience, multiplayer is often musically relegated to simply menus or repurposed music from the single-player campaign. I think I've specifically written for multiplayer once, so custom scoring not just one but two different perspectives of a multiplayer campaign is definitely a new twist.

There's more than two hours of music, which is on par with a single-player campaign – so the player gets the emotional connection of a single-player shooter combined with the fun and teamwork of a co-op game. ■

John Broomhall is a game audio specialist creating and directing music, sound and dialogue. Find him at **www.johnbroomhall.co.uk**

Evolve composer Jason Graves (above) says many of the music cues used to represent the game's colossal monsters were created with a 1920s piano soundboard

UNITY FOCUS

Sneaking ahead with Unity 5

We speak to Camouflaj's Ryan Payton about being first out of the door with the new engine

Above: Camouflaj used the graphical improvements of Unity 5 to make the PC version of République stand out from its mobile forebear

Below: Camouflaj and Unity released several comparison shots to show the differences between the previous and new versions of the engine

LAUNCHING LESS THAN a week ahead of GDC, Camouflaj's *République Remastered* is the first commercial title to be built with Unity 5. An enhanced version of the episodic mobile series, the game makes use of some of Unity's latest features.

Studio boss Ryan Payton tells *Develop* that the beta version of Unity 5 was the "sexy new feature" he was looking for, having promised his Kickstarter backers that a PC version of *République* would be much more than a straight port.

Crucially, Unity 5 enabled Payton and his team to overcome some of the limitations they faced with the previous engine and their target platform – although he remains proud of what Camouflaj was able to achieve with Unity 4.

"When you're developing on mobile, especially something that's graphically ambitious like *République*, optimising the game can be a painful process," he said. "We had to make concessions for things like lighting, which was frustrating because so much of our game comes down to mood and dark tones.

"We were finally able to unclamp our high-res textures and embrace Unity 5's physically-based shading and real-time global illumination, giving the game a much more realistic look and feel. Because Unity 5's headlining graphics features are all based on real-life properties, it was amazing to see the team produce realistic environments once they converted our assets to physically-based."

> ***"I'm really excited to see what other developers do once they get their hands on Unity 5."***
>
> Ryan Payton, Camouflaj

Payton says the graphical improvements, and how accessible the new features are, is Unity 5's biggest improvement.

"It brings high-end graphics to the masses," he says. "It also improves workflow and removes the need for guess work during the art creation process.

"To me, Unity 5 is a significant release because it allows small devs like us to compete on a visual level that used to be exclusive to big, triple-A teams. While we've received a lot of praise for how *République Remastered* looks in Unity 5 – and the art and dev team here deserve that praise – this is only the beginning. I'm really excited to see what other developers do once they get their hands on Unity 5, because we're only scratching the surface."

Unity 5 is now available in two editions: Professional and Personal. While the former is priced at $75 per month, the free Personal edition ensures Unity remains available to hobbyists, smaller studios and indies.

Payton believes upgrading to Unity 5 was worth the effort – even though his team faced the risks of a beta scheme.

"Now Unity 5 is released to the public, developers should have an easier time transitioning because they'll be on a stable version and they'll have the community as a resource," he says, before teasing: "Speaking of community, Camouflaj is going to be doing something special to help developers with the transition to Unity 5, which we'll be able to talk about soon." ■

RÉPUBLIQUE REMASTERED
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Publisher: Camouflaj
Platform: PC
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TOOLS SPOTLIGHT:
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SERVICES SPOTLIGHT

This month: **Carbon Digital**

CARBON DIGITAL WAS founded by married couple Paul and Sue McHugh (*pictured left*), who first met while working at Liverpool-based PlayStation developer Psygnosis in the 1990s, before moving on to Rage Software together.

As the millennium approached, the duo branched out on their own to form Carbon Digital, focusing on animation. Their debut project was an interactive animated website for Rage and its latest titles, but the couple had their sights set on far broader horizons than video games.

"We wanted to take our range of skills to a wider audience," explains Sue McHugh. "At the time, the web market was huge and we developed some really edgy and groundbreaking visual work for some high-end clients.

"With this commercial experience, and our skills in 3D, we knew we could target visual effects and production work. Since then our client portfolio has increased and includes the likes of Unilever, BBC, and British Cycling."

Over the last year, the McHughs have gone to great lengths to strengthen ties with the industry where they found their start. Securing funding from Creative England – the organisation that helps develop tech and digital start-ups around the country – a brand new division of Carbon Digital was launched. Headed up by business director Ian Richardson, it specifically focuses on game trailers.

> ***"Our vision is to build our reputation for creating top-class work for TV adverts and game trailers."***
> Sue McHugh, Carbon Digital

"Bizarrely, given our background in games, this was an untapped area for us," said McHugh. "We had focused previously on commercials and broadcast mainly."

While Carbon was able to attract the likes of *Moshi Monsters* creator Mind Candy, it was a partnership with former employers PlayStation that proved to be a real shot in the arm for the company. Instead of a trailer, Carbon Digital was commissioned to produce the intro sequence for last year's *LittleBigPlanet 3*. McHugh says the impact of this project cannot be understated.

"That work has changed the company," she says. "The scale of this project has been a fantastic showcase of our capabilities in a large scale production, as well as the entire post and VFX pipeline."

Carbon Digital continues to expand its games team as well, with the recent appointment of 3D artist Carleen Houbart. McHugh says there will be plenty more opportunities for people interested in working in animation.

"We are always looking for additional experienced VFX artists," she says. "We look for high-level CGI skills, but importantly, candidates with a keen artistic eye. We need our artists to be able to finish work to an extremely high level and deliver seamless VFX shots."

Earlier this year, Creative England named Carbon Digital as one of the organisation's Future Leaders: a collection of firms that are using

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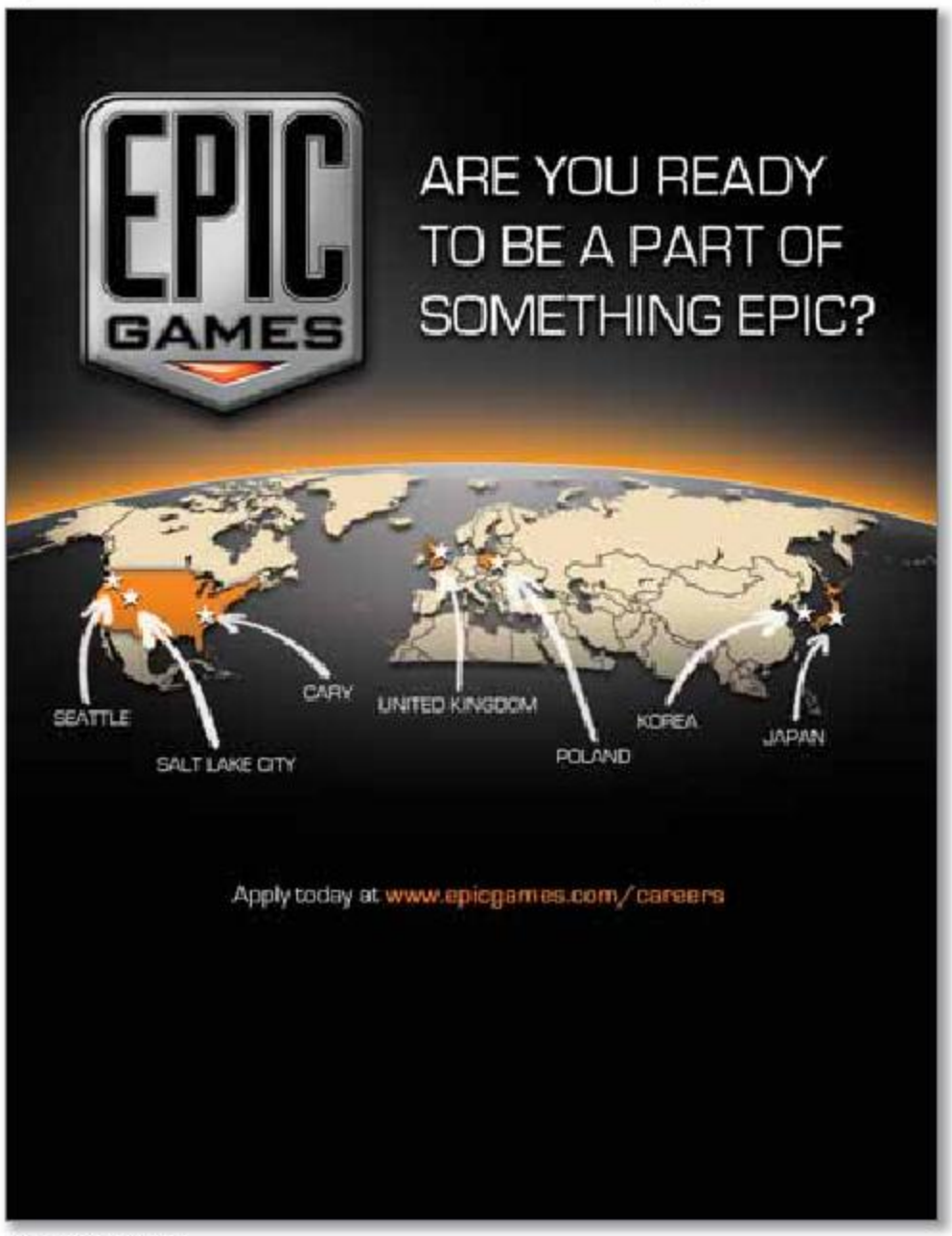

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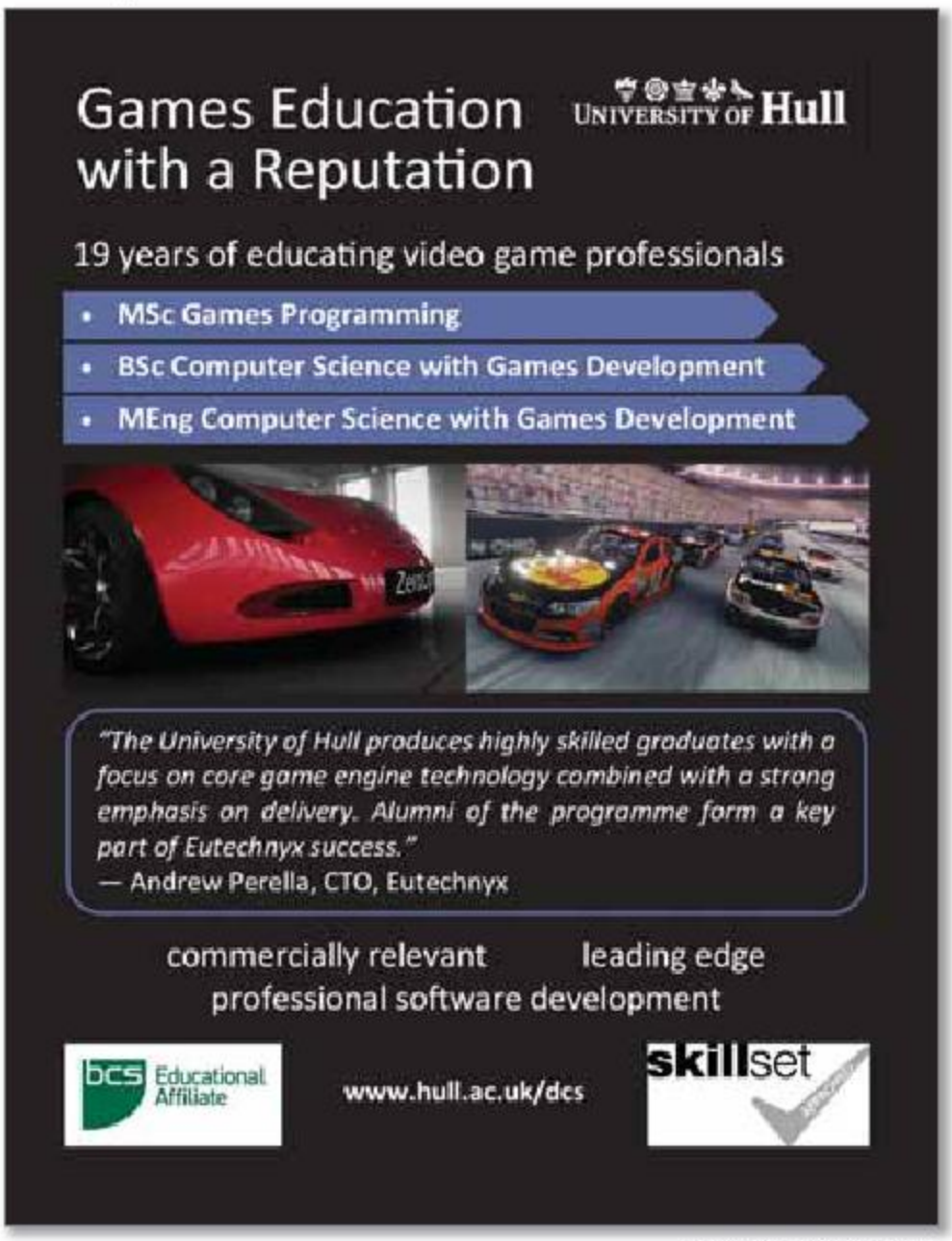
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Creative England's funding to lead and potentially change their field.

"We were absolutely delighted to receive this accolade in January; it was a great start to the year," says McHugh. "To be named as one of just ten Future Leaders is a testament to the work the whole team at Carbon Digital has achieved in the past year. I am sure that our work on *LittleBigPlanet 3* was a factor in the judging process, given the importance of that brand."

Now McHugh and her team are determined to live up to this accolade, with some major contracts in games and other fields to announce soon.

"We want to continue our work on large-scale productions, especially projects which combine high-end visual effects," she adds. "Our vision is to build our reputation for creating top-class work for television commercials and game trailers. We also want to build our profile and Paul's reputation as a leading director.

"We believe we can offer a unique and superlative service to games developers and publishers, and we are looking forward to working with more clients in this area." ■

The Carbon Digital team (above) is working on some "major" new contracts in games and other fields, which it hopes to announce soon

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TOOLS SPOTLIGHT

This month: **Houdini Engine**

Side Effects Software
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HOUDINI IS A tool that has classically been used by VFX experts in film, but over the years has been making waves in the games industry.

The tool offers a procedural workflow that makes it possible for developers to accommodate late changes in the production process, without having to completely rebuild assets. Developers can use this approach to build landscapes, distribute props, create destruction shots and design in-game effects.

"Houdini's procedural workflow involves building node networks that define a repeatable 'recipe'," explains Side Effects Software games segment director Judith Crow.

"These networks are wrapped into custom 'smart' assets which can be loaded into game editors such as Unity or Unreal while the Houdini Engine 'cooks' the nodes behind the scenes."

Crow says large studios meanwhile can use Houdini to collaborate more easily amongst artists and partners, as procedural workflows can be shared to ensure consistency.

Games that have used the tool include Insomniac's *Sunset Overdrive*, Naughty Dog's *Uncharted 3: Drake's Deception*, and *Killzone 2*, *3* and *Shadow Fall* by Guerrilla Games.

> ***"Artists can build digital assets for use inside Unity or Unreal."***
>
> Judith Crow

Crow goes on to say the tool can be used for multiple iterations that support the creative process throughout production, and adds smaller studios can use it to tackle larger projects that may otherwise require too much time or more artists.

To further help indie developers, the firm has released Houdini Indie as a more affordable solution. The Houdini Indie licence provides access to the toolset at a lower price of $199 for those whose gross revenues do not exceed $100,000.

"Artists can build digital assets for use inside Unity or Unreal," she says of the tool. "There is also a Houdini Engine Indie license for artists that only need to work inside their game editor."

The latest features to Houdini include a new position-based dynamics solver for granular simulation, new crowd pipeline tools, user interface enhancements and new UV tools.

Side Effects plans to add more modelling and UV texturing tools for game artists in later updates, as well as adding features to its Houdini Engine plug-ins, which all Indie licence owners will get as they are released. ■

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STUDIO SPOTLIGHT

This month: **Massive Entertainment**

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Tell us about your studio for those who are unfamiliar with your work. Martin Hultberg, head of communications: Massive Entertainment has been around since 1997. Our portfolio ranges from classic strategy games like *Ground Control* and *World in Conflict* to more recent triple-A blockbusters like *Assassin's Creed: Revelations* and *Far Cry 3*.

Our teams are currently working on Uplay for PC, *Just Dance Now* for mobile and *Tom Clancy's The Division*. These projects have created a strong demand for cutting edge technology, which is why we also work with our own proprietary technology UbiBluestar for mobile and the Snowdrop engine for new-gen triple-A games.

What makes your studio stand out?
There are many excellent studios out there. What defines our work is a belief in empowering the craftsman, the developer, and a fascination with quality in everything we do. At the studio we also try to give room for people's passions, not just in relation to the job, but everything from environment to community outreach. We work hard to let people excel in all aspects of their life.

What was the biggest development in 2014 for you?
The Division. It is a beast of a game. In addition, releasing *Just Dance Now* was tremendously interesting for us since it is basically completely platform-agnostic, and it takes us to many new markets and opportunities.

How has the studio been working with Reflections on *The Division*? How smooth has communication been between nations?
Reflections are awesome, and in the same timezone as us, and we don't have any significant language or cultural barriers so we have a good foundation to start from.

Co-development is still a challenge due to the scope and complexity of the tasks though. Fortunately for us, the nice folks at Reflections are very experienced and eager to help. They are a great co-dev partner.

Ubisoft studios are known for sharing technology. What are you hoping to share from *The Division*?
The answer here clearly has to be the Snowdrop engine. It is a powerful tool we hope many Ubisoft teams will take advantage of.

What lessons have you learned from other open-world online games while developing *The Division*?
Maybe not unique to open-world games per se but engaging the community in as many ways as possible is crucial. Fans have always been important to us, since way back with *World in Conflict*, but we are taking it much further now.

> ***"We have bee hives on the balcony, adopted carnivores with Africat in Namibia and a large fish tank."***
>
> Martin Hultberg, Massive

Are you recruiting or expanding the team at the moment?
We have been growing for the last few years and there are always open positions. We have close to 400 people working here and a third are ex-pats, which is pretty cool.

What we look for in people is an ability to function well in a team, a passion for their job and of course the necessary experience or skills to deliver on the tasks.

What do you hope to accomplish this year?
To create the start of a new franchise for one of the world's most famous brands by launching *Tom Clancy's The Division*.

Tell us something about Massive that no one knows.
Little known fact outside of the studio – we have bee hives on the balcony, adopted carnivores with Africat in Namibia and a large fish tank by the pool table. We love animals. ■

Ubisoft-owned and Malmö-based developer Massive Entertainment has been working on The Division, due this year, which Martin Hultberg (below right) hopes will turn into a new franchise for the firm

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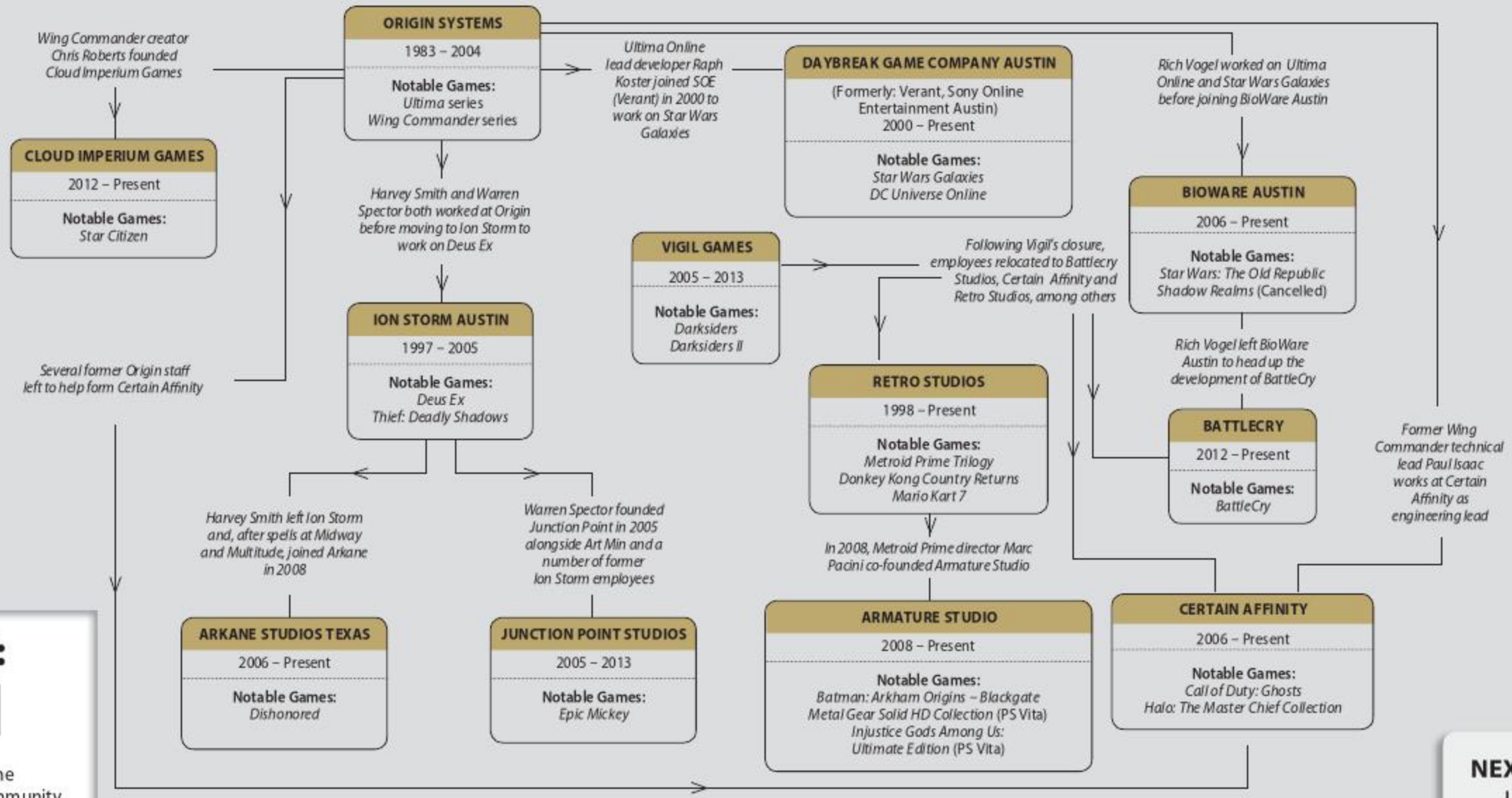
Wing Commander creator Chris Roberts founded Cloud Imperium Games
ORIGIN SYSTEMS
1983 – 2004
Notable Games:
Ultima series
Wing Commander series
Ultima Online lead developer Raph Koster joined SOE (Verant) in 2000 to work on Star Wars Galaxies
DAYBREAK GAME COMPANY AUSTIN
(Formerly: Verant, Sony Online Entertainment Austin)
2000 – Present
Notable Games:
Star Wars Galaxies
DC Universe Online
Rich Vogel worked on Ultima Online and Star Wars Galaxies before joining BioWare Austin
CLOUD IMPERIUM GAMES
2012 – Present
Notable Games:
Star Citizen
Harvey Smith and Warren Spector both worked at Origin before moving to Ion Storm to work on Deus Ex
VIGIL GAMES
2005 – 2013
Notable Games:
Darksiders
Darksiders II
Following Vigil's closure, employees relocated to Battlecry Studios, Certain Affinity and Retro Studios, among others
BIOWARE AUSTIN
2006 – Present
Notable Games:
Star Wars: The Old Republic
Shadow Realms (Cancelled)
ION STORM AUSTIN
1997 – 2005
Notable Games:
Deus Ex
Thief: Deadly Shadows
Several former Origin staff left to help form Certain Affinity
Rich Vogel left BioWare Austin to head up the development of BattleCry
RETRO STUDIOS
1998 – Present
Notable Games:
Metroid Prime Trilogy
Donkey Kong Country Returns
Mario Kart 7
BATTLECRY
2012 – Present
Notable Games:
BattleCry
Former Wing Commander technical lead Paul Isaac works at Certain Affinity as engineering lead
Harvey Smith left Ion Storm and, after spells at Midway and Multitude, joined Arkane in 2008
Warren Spector founded Junction Point in 2005 alongside Art Min and a number of former Ion Storm employees
In 2008, Metroid Prime director Marc Pacini co-founded Armature Studio
ARKANE STUDIOS TEXAS
2006 – Present
Notable Games:
Dishonored
JUNCTION POINT STUDIOS
2005 – 2013
Notable Games:
Epic Mickey
ARMATURE STUDIO
2008 – Present
Notable Games:
Batman: Arkham Origins – Blackgate
Metal Gear Solid HD Collection (PS Vita)
Injustice Gods Among Us: Ultimate Edition (PS Vita)
CERTAIN AFFINITY
2006 – Present
Notable Games:
Call of Duty: Ghosts
Halo: The Master Chief Collection

THIS MONTH: AUSTIN

Following last month's look at the San Francisco development community, this month **Lee Bradley** hops across the states to explore the interconnected studios of this bustling Texas city.

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